Hospital - Cupboard -

The New England JOURNAL of MEDICINE

FORMERLY THE BOSTON MEDICAL AND SURGICAL JOURNAL

Official Organ of The Massachusetts Medical Society
The New Hampshire Medical Society—The Vermont State Medical Society
The New England Surgical Society—The Boston Surgical Society, Inc.
The New England Pediatric Society—The New Hampshire Surgical Club
The New England Obstetrical and Gynecological Society
And The Neisserian Medical Society of Massachusetts

OWNED AND PUBLISHED BY THE MASSACHUSETTS MEDICAL SOCIETY

Volume 211 Number 22 | Domestic $6 per Annum, 25c per Copy Canada $7.04, Foreign $8.52 | NOVEMBER 29, 1934 | Published Weekly in Boston at 8 Fenway

CONTENTS

NEW ENGLAND SURGICAL SOCIETY

Thrombosis of the Deep Veins of the Lower Leg, Causing Pulmonary Embolism. *John Homans* 993

Carcinoma of the Tonsil. A Statistical Study of Two Hundred and Thirty Cases. *LeRoy A. Schall* 997

The Heterophile Agglutination Test in the Diagnosis of Infectious Mononucleosis. *A. C. Van Ravenswaay* 1001

Industrial Surgery. *Frederic J. Cotton* and *Gordon Mackay Morrison* 1004

The Austin-Flint Murmur and Its Differential Diagnosis. *Clifton B. Leech* 1007

VERMONT STATE MEDICAL SOCIETY

Observations on Certain Phases of the Health of Sixty-Two Normal Boys Over a Period of a Year Together with a Description of a Method of Routine Physical Examination. *J. H. Blodgett* and *W. I. Mayo* 1009

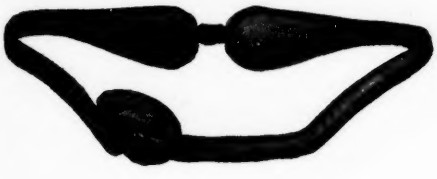
MEDICAL PROGRESS

Cardiovascular Review for 1933. (To be continued.) *Paul D. White* and *Howard B. Sprague.* 1015

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Case 20481—*Leland S. McKittrick, Langdon Parsons, George W. Holmes* and *Tracy B. Mallory.* Case 20482—*E. Parker Hayden, Harold L. Higgins* and *Tracy B. Mallory* 1025

(Contents continued on next page)



SURGICAL APPLIANCES
for
OVER SIXTY-FIVE YEARS

Frame Trusses
Belts *Corsets*
Elastic Stockings
Artificial Limbs
Orthopedic Appliances

The **POMEROY Frame Truss**

Closely contacting the body at every point, the Pomeroy Frame Truss is unaffected by movement or changes in position. Combined with the water pad (first used by Pomeroy over sixty-five years ago), it is the one apparatus perfectly adapted to retain the hernia.

The fitting and shaping is done by experts since the usefulness of the Frame Truss depends on accurate adjustment. Guaranteed to retain hernia comfortably and securely *when fitted by Pomeroy.*

Pomeroy Company

41 West Street, Boston, Mass.

New York Brooklyn Springfield
Bronx Newark Detroit
Wilkes Barre

Entered at the Postoffice at Boston as Second Class Matter

CONTENTS

(Continued)

EDITORIALS
Honi Soit Qui Mal Y Pense 1031
Boston Council of Social Agencies 1031
This Week's Issue 1032

THE MASSACHUSETTS MEDICAL SOCIETY
Dr. Gallie, Shattuck Lecturer for 1935 1034
Second Annual Postgraduate Medical Extension Course 1034

CORRESPONDENCE
Building the Panama Railroad. Directions for Health in the Tropics in 1850. Wm. Pearce Coues 1034
The Medical Profession and the Lay Press. Stanley B. Weld 1033
The Opening of the Contagious Ward of the Children's Hospital. G. v. L. Meyer 1033
The Suspension of the Registration of Dr. Hurovitz. Stephen Rushmore 1033

MISCELLANY
The Election of Surgeon-General Cumming 1033
The Harvard-African Expedition 1033
Mental Hygiene and Public Health 1008

NOTICES 1035
REPORTS AND NOTICES OF MEETINGS 1036
SOCIETY MEETINGS, CONGRESSES AND CONFERENCES 1038

The Massachusetts Medical Society

The next Annual Meeting of the Massachusetts Medical Society will be held in Boston, at the Hotel Statler, June 3, 4, and 5, 1935.

OFFICERS AND STANDING COMMITTEES ELECTED BY THE COUNCIL, JUNE 5, 1934

PRESIDENT: WILLIAM H. ROBEY, Boston.
VICE-PRESIDENT: PHILEMON E. TRUESDALE, Fall River.
SECRETARY: WALTER L. BURRAGE, Brookline.
TREASURER: CHARLES S. BUTLER, Boston.

STANDING COMMITTEES FOR 1934-1935

COMMITTEE OF ARRANGEMENTS
W. M. Shedden, *Chairman;* W. R. Morrison, Horatio Rogers, W. S. Burrage, R. P. Stetson.

COMMITTEE ON PUBLICATIONS
R. I. Lee, *Chairman;* Homer Gage, R. B. Osgood, R. M. Smith, F. H. Lahey.

COMMITTEE ON MEMBERSHIP AND FINANCE
D. N. Blakely, *Chairman;* G. C. Caner, J. E. Fish, H. F. Newton, H. Q. Gallupe.

COMMITTEE ON ETHICS AND DISCIPLINE
David Cheever, *Chairman;* W. D. Ruston, S. F. McKeen, A. C. Smith, R. L. DeNormandie.

COMMITTEE ON MEDICAL EDUCATION AND MEDICAL DIPLOMAS
Reginald Fitz, *Chairman;* C. H. Lawrence, C. A. Sparrow, E. S. Calderwood, A. S. Begg.

COMMITTEE ON STATE AND NATIONAL LEGISLATION
W. H. Robey, *Chairman;* T. J. O'Brien, F. E. Jones, A. W. Mark, Shields Warren.

COMMITTEE ON PUBLIC HEALTH
Dwight O'Hara, *Chairman;* E. F. Cody, F. G. Curtis, Gerald Hoeffel, G. D. Henderson.

COMMITTEE ON MALPRACTICE DEFENSE
F. G. Balch, *Chairman;* E. D. Gardner, F. B. Sweet, R. P. Watkins, A. W. Allen.

COMMITTEE ON PERMANENT HOME: T. J. O'Brien, *Chairman;* S. B. Woodward, C. G. Mixter, J. M. Birnie, R. B. Greenough.

OFFICERS OF THE SECTIONS FOR 1935

ELECTED BY THE SECTIONS

(The street addresses may be obtained from the Annual Directory)

SECTION OF MEDICINE
Chairman, Francis M. Rackemann, Boston; *Secretary,* Richard P. Stetson, Chestnut Hill and Boston.

SECTION OF SURGERY
Chairman, Ralph W. French, Fall River; *Secretary,* E. Parker Hayden, Boston.

SECTION OF TUBERCULOSIS
Chairman, Donald S. King, Boston; *Secretary,* Olin S. Pettingill, Middleton.

SECTION OF PEDIATRICS
Chairman, Joseph Garland, Boston; *Secretary,* James M. Baty, Belmont and Boston.

SECTION OF OBSTETRICS AND GYNECOLOGY
Chairman, Thomas Almy, Fall River; *Secretary,* Charles J. Kickham, Brookline.

SECTION OF RADIOLOGY AND PHYSIOTHERAPY
Chairman, Franklin P. Lowry, Newton; *Secretary,* Philip H. Cook, Worcester.

SECTION OF DERMATOLOGY AND SYPHILOLOGY: *Chairman,* Charles J. White, Boston; *Secretary,* William P. Boardman, Boston.

OFFICERS OF THE DISTRICT MEDICAL SOCIETIES

ELECTED BY THE DISTRICT MEDICAL SOCIETIES AT THEIR ANNUAL MEETINGS, BETWEEN APRIL 15 AND MAY 15, 1934.

(The street addresses may be obtained from the Annual Directory)

BARNSTABLE—*President,* J. L. Chute, Osterville; *Vice-President,* P. P. Henson, Hyannis; *Secretary,* J. I. B. Vail, Hyannis; *Treasurer,* H. B. Hart, Yarmouthport; *Librarian,* E. E. Hawes, Hyannis.

BERKSHIRE—*President,* W. P. Kelly, Pittsfield; *Vice-President,* R. J. Carpenter, North Adams; *Secretary,* H. J. Downey, Pittsfield; *Treasurer,* C. T. Leslie, Pittsfield.

BRISTOL NORTH—*President,* F. V. Murphy, Attleborough; *Vice-President,* L. E. Butler, Taunton; *Secretary,* C. B. Kingsbury, Taunton; *Treasurer,* J. V. Chatigny, Taunton.

BRISTOL SOUTH—*President,* Frank M. Howes, New Bedford; *Vice-President,* E. L. Merritt, Fall River; *Secretary-Treasurer,* Charles Shanks, New Bedford.

ESSEX NORTH—*President,* John Parr, Methuen; *Vice-President,* C. F. Warren, Amesbury; *Secretary-Treasurer,* E. S. Bagnall, Groveland.

ESSEX SOUTH—*President,* C. L. Hoitt, Lynn; *Vice-President,* G. E. Tucker, Salem; *Secretary,* R. E. Stone, Beverly; *Treasurer,* Andrew Nichols, III, Danvers; *Librarian,* C. M. Cobb, Lynn.

FRANKLIN—*President,* H. B. Marble, Shelburne Falls; *Vice-President,* W. J. Pelletier, Turners Falls; *Secretary-Treasurer,* Charles Moline, Sunderland.

HAMPDEN—*President,* A. J. Douglas, Westfield; *Vice-President,* T. S. Bacon, Springfield; *Secretary-Treasurer,* H. L. Smith, Springfield.

HAMPSHIRE—*President,* T. F. Corriden, Northampton; *Vice-President,* L. B. Pond, Easthampton; *Secretary-Treasurer,* F. E. O'Brien, Haydenville; *Librarian,* Jane B. Armstrong, Northampton.

MIDDLESEX EAST—*President,* J. H. Fay, Melrose; *Vice-President,* F. O. West, Woburn; *Secretary,* K. L. Maclachlan, Melrose; *Treasurer,* Richard Dutton, Wakefield; *Librarian,* J. M. Wilcox, Woburn.

MIDDLESEX NORTH—*President,* F. R. Mahoney, Lowell; *Vice-President,* E. O. Tabor, Lowell; *Secretary,* T. A. Stamas, Lowell; *Treasurer,* M. D. Bryant, Lowell; *Librarian,* P. J. Meehan, Lowell.

MIDDLESEX SOUTH—*President,* A. H. Blake, West Somerville; *Vice-President,* S. H. Remick, Waltham; *Secretary,* A. A. Levi, Cambridge; *Treasurer,* Edward Mellus, Newton; *Librarian,* N. A. Gallagher, Malden.

NORFOLK—*President,* Cadis Phipps, Brookline; *Vice-President,* L. E. Johnson, Norwood; *Secretary,* F. S. Cruickshank, Brookline; *Treasurer,* G. W. Kaan, Sharon.

NORFOLK SOUTH—*President,* F. A. Bartlett, Quincy; *Vice-President,* T. B. Alexander, Scituate; *Secretary-Treasurer-Librarian,* N. R. Pillsbury, South Braintree.

PLYMOUTH—*President,* L. A. Alley, Lakeville; *Vice-President,* W. T. Hanson, Bridgewater; *Secretary,* G. A. Moore, Brockton; *Treasurer,* A. C. Smith, Brockton; *Librarian,* J. H. Weller, Bridgewater.

SUFFOLK—*President,* R. L. DeNormandie, Boston; *Vice-President,* Conrad Wesselhoeft, Boston; *Secretary,* G. P. Reynolds, Boston; *Treasurer,* John Rock, Boston.

WORCESTER—*President,* E. B. Emerson, Rutland; *Vice-President,* W. F. Lynch, Worcester; *Secretary,* E. C. Miller, Worcester; *Treasurer,* E. P. Disbrow, Worcester; *Librarian,* A. C. Getchell, Worcester.

WORCESTER NORTH—*President,* C. B. Gay, Fitchburg; *Vice-President,* C. H. Jennings, Fitchburg; *Secretary,* F. M. McMurray, Fitchburg; *Treasurer,* F. H. Thompson, Jr., Fitchburg.

The New England
Journal of Medicine

VOLUME 211 NOVEMBER 29, 1934 NUMBER 22

NEW ENGLAND SURGICAL SOCIETY

THROMBOSIS OF THE DEEP VEINS OF THE LOWER LEG, CAUSING PULMONARY EMBOLISM*

BY JOHN HOMANS, M.D.†

THERE is a dangerous form of venous thrombosis, uncommon enough to make its study difficult, yet so often fatal as to make its recognition a matter of importance, the more so as, in its early stages, it is usually recognizable and probably curable. Any one individual's experience is so limited as to make generalizations hazardous, and it is conceivable that many of you will recognize the disorder to which I refer as something far less serious than I have found it. Yet of the four patients who have suffered from the disease in question, two have died of pulmonary embolism, one has recovered after ligation of the femoral vein in the thigh and the fourth, without other treatment than rest in bed.

The disease differs from other sorts of thrombophlebitis in beginning as a local thrombosing process in the normal, that is, non-varicose, deep veins of the lower leg. I am aware that to many of you this is no distinction. You may believe, for instance, that the thrombosis of phlegmasia alba dolens, the familiar "milk leg" or deep phlebitis, occurs first in this situation. Now I will not deny this possibility, or any other, but will content myself with pointing out the distinguishing features of the various kinds of thrombophlebitis with which I am familiar.

A local, deep thrombosis in the lower leg begins with a variable but, on the whole, a moderate amount of discomfort in the calf, swelling at the ankle, and blueness of the foot; signs which are rather promptly made to disappear upon rest in bed, but which recur over and over again upon attempting the use of the leg. It is hard to believe that, as a result of elevation for only a day or two, the leg, actually the seat of an extensive deep thrombosis, can take on so nearly, or completely, normal an appearance. Yet autopsy in the fatal cases has shown a remarkably widespread, persistent thrombosis in the great vessels among the muscles of the calf. In each case, the femoral vein was actually unobstructed and the cause of the fatality was the detachment of a considerable fragment of an enormously long, insecure thrombus which had been waving, as it were, in the current. Possibly, if the patients had lived longer, the thrombosing process might solidly have filled the femoral and iliac veins, and then there would finally have been presented the picture of phlegmasia alba dolens. The fact is, however, that in the course of some weeks, even months in these two instances, no such thing occurred—the long clot broke off first. Doubtless there is more than one explanation why the disease acts in this way. The hypothesis which I will offer presently is reasonable enough, however, to fix in your minds the difference between other sorts of thrombophlebitis and this fatal form.

Thrombophlebitis in varicose veins is, obviously, related to the unhealthy state of the vein's wall. Whether a "latent" infection is present is immaterial. The fibrosis and distortion, not to speak of the effect of sudden overstretching on particular occasions, are quite enough to account for thrombus formation. The leg as a whole is not swollen, the reaction being confined to the neighborhood of the varicose vein. The clot is usually quite well fixed, as one might expect, and is rarely detached, though I have, on one occasion, divided a thrombosed varicose vein at the groin because of repeated pulmonary infarction.

Thrombophlebitis of the migrating type, that is, the phlebitis migrans so commonly associated with thromboangiitis obliterans and occasionally seen as independent disease, is a local superficial process, an inflammatory lesion which never leads to extensive thrombosis or swelling of the affected limb.

Thrombophlebitis of the "milk-leg" type, that is, phlegmasia alba dolens, is primarily a pelvic process, though the thrombosis may extend for a long distance peripherally. Explorations by the writer have shown that in many instances there is an active exudative reaction about the external iliac artery and vein (the common iliac or even the vena cava in some cases). The great vein is solidly obstructed by a firm thrombus. The whole leg, not just the

*From the Surgical Clinic of the Peter Bent Brigham Hospital.

Read before the Annual Meeting of the New England Surgical Society at Burlington, Vt., September 28, 1934.

†Homans, John—Surgeon to Peter Bent Brigham Hospital. For record and address of author see "This Week's Issue," page 1032.

lower portion, is swollen. In some instances, there is evidence of arterial spasm resulting in some degree of ischemia. In all cases, going to bed has little effect upon the disease, the swelling persisting in even the mildest cases for a week or ten days and occasionally for many months. There is often tenderness over the side of the pelvis corresponding to the swollen leg. There is always tenderness over the deep vessels at the groin and over the femoral canal. Sometimes the saphenous vein is noticeably involved. In other instances, it is seen to be dilated, particularly in the groin, as if it were acting as a collateral. Embolism, considering the frequency of the disease, is uncommon, a matter which may be related to what seems to me to be the usual source of the process, that is, an inflammatory reaction within the arteriovenous sheath. This may give an adhesiveness to the thrombus which is absent in the type of disease which forms the subject of this paper. In this connection, Cruveilhier, who described deep, iliac phlebitis so many years ago, said that he had never seen inflammation within the vein, but always in its wall.

The explanation which I venture to offer for the peculiar behavior of primary thrombosis in the calf depends somewhat on anatomical and somewhat on clinicopathological grounds. It fails to account for the mysterious tendency to thrombosis exhibited by some individuals at particular times, and offers no explanation of why some particular injury or infection causes thrombosis in one person and not in another. Nor does it explain why all such processes, especially the fatal ones, occur in those in middle age, not in the young or, in my experience, the senile.

The great muscles of the calf, perhaps the most active of the body, require an enormous emergency circulation. The amount of blood brought to them and necessarily carried off again, when especially violent exercise is going on, is tremendously in excess of that used in the resting state. This sounds rather trite but, after all, the legs are different from the arms, being dependent, more often under strain and, as everyone knows, giving out, so far as their emergency circulation is concerned, in athletes at a surprisingly early age. Necessarily, then, there is present, among the muscles, an enormous network of veins* so arranged that most of the time the greater part of it is idle and only on special occasions is used to capacity. It empties, through what amounts to a bottle-neck, into the relatively few veins which pass the knee, and though these latter have a considerable capacity, it must be true that when the great vessels of the calf are engorged, the current within them is relatively slower than in the popliteal and femoral veins. It must also be true, and this is of immediate clinical significance, that the great muscular networks can never become completely obstructed. There are always byways and extra outlets. A very extensive thrombosis can evidently be tucked away in the calf without being noticed, *provided the leg is not put to active use.* But there is another implication of almost equal importance. Suppose a thrombosis to be started among the muscles. As new pathways are opened, the thrombosis can progress into them, occupying stagnant parts and only coming to a halt, for the moment, when it meets (1), a good strong current or (2), an empty vessel not yet filled with blood. As for the long, free-waving clot, the clot which finally breaks off and kills the patient, it is clear that unless the original thrombosis is promptly brought to a standstill and either sealed off or tunnelled out, propagation of an unfixed thrombus is always threatened. For at many points, the thrombosing process in the intermuscular and intramuscular veins must touch the current of some of the larger venae comites. Once the end of a thrombus, which usually, of course, is healed over, *succeeds* in poking its head into the larger vessel, it is not likely to become fixed to the healthy wall of that vein, particularly in a rapid current, but becomes the dangerous propagating thrombus, partly filling but not choking the passage for many inches. It might be pointed out that the squeezing action of the calf muscles always threatens to push the end of a long clot into a larger vein at one point or another.

The above considerations are not too fanciful. They correspond with the facts. In one of my patients, who died of an embolism, the autopsy showed that he had been nourishing a localized thrombosis in the calf for several months. Actually, he had not noticed it at all until shortly before his end, which must be very unusual. In another fatal case, the disease had vacillated for six months, repeatedly sending the patient to bed and seeming to be cured by rest. It was the fatal experience of this patient which led Dr. Channing Frothingham to refer to me a woman of forty-four who, after a trifling injury to her foot, developed evidence of a similar local thrombosis.

A brief account of these two patients of Dr. Frothingham, to whom I am indebted for the privilege of making this report, is as follows:

CASE I. A man, fifty years of age, spare, athletic and sound. On November 30, 1927, he suffered a severe contusion of his left foot in an automobile accident. Walking was painful. The x-ray revealed a comminuted fracture of the 5th metatarsal bone

*These intermuscular and intramuscular veins are very little described in the anatomical textbooks. They have, however, in the past, been made the subject of intensive studies by French Anatomists, notably in a Paris Thesis of 1867, by A. Le Dentu, under the title: "Recherches anatomiques et considérations physiologiques sur la circulation veineuse du pied et de la jambe," and in a similar publication of 1883, by L. Jarjavy, under the title: "Contribution à l'étude du système veineux." Both these authors speak of the abundant "Canaux de Sûreté," a name given by Verneuil.

(proximal end). Local swelling. A plaster mold was applied—toes to knee—by Dr. Cheever. The mold was left on for a week after which the patient went about with crutches but without bandages. For the next six weeks he kept about without especial difficulty and in the middle of February, 1928, he went to Bermuda, playing two rounds of golf a day! However, during this time his leg was always uncomfortable. On March 16th, his leg was painful and his ankle swollen. By the advice of Dr. Frothingham, he went to bed and the leg rapidly improved. Again he got about, but soon had to return to bed with more swelling. From this time on, he continued to walk with crutches, not really using his muscles. He was never free from swelling of his ankle and lower leg. No tenderness. No blueness. On April 12, 1928, four and a half months after his injury, he died suddenly of a pulmonary embolism.

The autopsy showed that "the femoral vein and its tributaries contained only liquid blood". There was slight adhesion of the venae comites to the popliteal artery and in the mid-popliteal space. One of the popliteal veins was thrombosed up to a point where a clean fractured surface showed where the great embolus had broken off. It had undoubtedly been waving free in the femoral vein for some time. There was extensive thrombosis in the veins of the soleus muscle, in some instances adherent, in others in the form of casts. The thrombosis extended down the posterior tibial to the ankle, but no connection with the region of fracture was seen.

The embolus was 15.5 cm. in length, that is, 6 inches, plus. One end fitted the broken end of the popliteal thrombus; the other was pointed. According to this measurement, division of the femoral vein above the profunda would have forestalled the fatal embolism.

It will be noticed that while the thrombosing process was going on—it must have dated back to the injury—the patient was able to play golf and merely felt local discomfort. For the last four weeks of his life his leg would swell when he went about and recover when he went to bed. There was no blueness when the leg was at rest, and no tenderness; no swelling above the knee at any time.

Case II. A woman, forty-three years of age, well built and strong. In October, nine weeks before I saw her, she fell, in some way twisting her left foot. The foot was painful, so that after a day or two she went to bed. She was then found to have an oblique fracture through the proximal end of the 5th metatarsal bone.

She remained in bed for ten days and on getting up began to notice pain in the left calf with swelling of the ankle and lower leg. As soon as Dr. Frothingham sent her to bed, the pain and swelling rapidly disappeared. On getting up, the symptoms recurred. Again she went to bed and, after a few days, cautiously got about again without a return of symptoms until she took a particularly long walk, when the pain and swelling returned. However, she was not incapacitated. The swelling would appear in the afternoon and go down at night.

When I saw her, only a little edema below the left external malleolus remained. No evidence of a superficial collateral venous circulation. No tenderness. The foot appeared very faintly cyanotic. Dr. Frothingham felt that this case exactly resembled the fatal one just described and asked me to safeguard her against embolism if possible.

December 19, 1929, about two months after the original accident, the femoral vein was ligated just below the saphenous. Exploration of the popliteal space showed no clot at this level.

Six weeks later, the patient still complained of her foot (the fracture?) but the swelling never recurred.

As to whether a life was saved by this operation, I can only tell you that the two patients up to the time of my operation behaved almost exactly alike. Both had trifling fractures of the foot. Both had discomfort and edema promptly relieved by rest. Postmortem examination upon the patient who died showed that high division of the femoral would have forestalled embolism from his long floating thrombus. The second patient was promptly relieved of all symptoms by operation. Possibly a propagating thrombus had not yet formed.

The next case is one of recovery from a peripheral thrombosis, presumably of the popliteal veins.

Case III. An athletic man, forty-five years of age. While being massaged by a powerful masseur, he felt as if something had been torn in the right popliteal space. However, he noticed nothing further until two days later, when his calf felt stiff and swollen on crossing his right knee over his left. That evening, his right calf was tense and a little warmer to the touch than the left, his popliteal space tense and tender as far as its upper angle. His body temperature was 100.8°. The superficial veins of the lower right leg were more noticeable than those of the left. The leg was placed on a Cabot posterior wire splint for ten days. By the end of four days all local signs had disappeared. The white count ranged between 11,000 and 13,000 during this time and then fell to normal.

The patient remained in bed for seventeen days. Then he was allowed to take a few steps and gradually increased the use of the leg. There was edema of the ankle at first but, a month after the injury, recovery was practically complete.

It must be supposed that there was an injury to the lesser saphenous vein. It may have been torn where it pierced the popliteal fascia or even torn from its popliteal connection. In any case there was presumably a popliteal thrombosis, but there is no evidence here of a thrombosis in the veins of the great calf muscles.

The last case is much like Case I. It illustrates the tolerance of a vigorous individual for thrombosis of the great venous system of the muscles in both leg and thigh and the difficulty of gauging the extent of the thrombosis.

Case IV. An active man of fifty-five years, rather plethoric and stout.

The apparent beginning of the illness was a feeling of lameness in the right knee which came on some five days after the onset of a severe cold. Dr. A. H. Brewster found the knee-joint stiff, its motion painful. There was fluid in the prepatellar bursa. He was under the care of Dr. Brewster and Dr. George P. Denny through the second week of his illness. At the end of this time, I first saw him. Two days before, he had been particularly active. The day before, his right leg had first become considerably swollen and cyanotic. He had felt a decided oppression in his chest and some breathlessness. He went to bed.

At this time, his lower right leg was a little cyanotic, with pitting edema over the tibia. No discomfort. No tenderness even on vigorous pressure upon either calf or thigh. No change above the knee. The saphenous vein in the calf was a little engorged.

From this time on, the patient had a daily afternoon fever of about 100°. He got up, using crutches to go to the bathroom but, in so doing, let his leg hang. When getting about in this way he became breathless but recovered at once on going back to bed. After two days in bed, his leg returned practically to normal. No swelling, discomfort or tenderness. Very slight cyanosis of his foot on hanging the leg down for some minutes. The general examination, including the heart and lungs, was entirely negative. Any one seeing him sitting up cheerfully in bed would have said that nothing ailed him.

At the end of a week of this apparent progress, he died of pulmonary embolism. Autopsy showed that the clot was a very long one and had already become organized in the pulmonary artery. There was clear evidence that it had been in the pulmonary artery for over a week, probably from the time he first noticed a feeling of oppression, the day before I saw him. This is strange enough, but it was even more surprising to discover that there was an extensive thrombosis of the muscular veins of both calf and thigh. The embolus had broken off from the popliteal vein, the long, propagating type which had been waving free in the femoral vein. But what I particularly wish to call to your attention is that the pathologist, Dr. Hass of the Peter Bent Brigham Hospital, found three definite, separate thrombotic processes in the calf, the oldest, well-healed, of some *months*' duration. Until the popliteal and lower femoral vein had become involved, the patient noticed nothing. His pulmonary embolism occurred within twenty-four to forty-eight hours of the first swelling of his leg though he showed no recognizable signs of it until eight days later. Had I divided his upper femoral when I first saw him, I should have been too late.

DISCUSSION

I think you will agree that all these patients appear to have suffered from a thrombosis in the lower leg. Two of them, who died of embolism, were found to have a very extensive old thrombosis among the muscles of the calf and of these, one had, in addition, a similar process in the great muscles of the thigh. Yet there was nothing in any case resembling the symptoms and signs of phlegmasia alba dolens. None of the initial crampy pain, the generalized edema and the heaviness of the whole limb. Again, there was nothing in any case resembling a thrombophlebitis in a varicose vein.

Yet the disease has a decided individuality. Its origin is, of course, utterly obscure, a trifling injury in three of the instances here quoted, arthritic signs (backed up by pathological lesions of acute rheumatism) in the fourth. But the thrombosis, once established, only shows itself when the affected leg is put to use; and on rest, seems to have disappeared. It may even come and go without calling itself to the notice of an active, unselfconscious individual. There is, in my experience, no tenderness, and as long as the leg is kept at the body's level, no edema and little if any cyanosis. There is a tendency for the thrombosis to progress into the main venous channel, that is, the femoral, and perhaps because there is no inflammatory reaction to fix the clot, the incidence of embolism is great.

Undoubtedly, patients recover, under immobilization or perhaps only rest in bed. Further experience with the disease will give more information as to the probability of recovery under conservative treatment. Prompt immobilization for ten days and further rest in bed for a similar period seem to have sufficed to cure Case III. That the rather complicated tests to detect an unusual tendency of the blood to clot, as described by Bancroft and Stanley-Brown, will prove of prognostic and therapeutic value in the condition here described is possible. At least, the attempt to correct such a tendency seems praiseworthy. Bancroft has tried sodium thiosulphate, giving 10 cubic centimeters of a ten per cent solution intravenously for three successive days, with apparent benefit, when thrombophlebitis was present or threatened.

Ligation of the femoral vein at the groin led to the prompt recovery of one patient in this series. It would almost certainly have saved the life of another. It would have failed in Case IV by the time the diagnosis was clear. It was not needed in Case III. I think that on seeing another of these patients, I should ligate the femoral at once. The point of election is just distal to the entrance of the saphenous vein but proximal to the profunda. It may be that some especially long thrombi extend higher than this (as was probably true of Case IV) yet ligation within the pelvis hardly seems advisable. Ligation at the point indicated permits the great saphenous vein to act as a collateral and to carry a good current close by the ligature in the femoral, forestalling the formation of a thrombus at this point.

CONCLUSIONS

Thrombosis of the veins in and among the muscles of the lower leg—a deep peripheral thrombosis—is a clinical entity, which runs a peculiar course.

The number of the intermuscular and intramuscular veins, their abundant anastomoses and collateral circulation, cause the thrombosis to present few or no external signs when the leg is not in use.

The incidence of fatal pulmonary embolism is high.

Ligation of the femoral vein at the groin is recommended, particularly when the thrombosis has become well established.

REFERENCES

Bancroft, F. W., and Stanley-Brown, Margaret: Postoperative thrombosis, thrombophlebitis and embolism. Surg. Gynec. Obst. 54:898, 1932.

Cruveilhier, Jean: Anatomie Pathologique du Corps Humain, 2: Book XXVII. Paris, Ballière, 1829-1842.

Jarjavy, L.: Contribution à l'étude système veineux. "Les canaux de sûreté," Paris Thésis, 1883.
Le Dentu, A.: Recherches anatomiques et considérations physiologiques sur la circulation veineuse du pied et de la jambe, Paris, 1867.

DISCUSSION

DR. DONALD S. ADAMS, Worcester, Mass.: I have enjoyed Dr. Homans' paper. The disease cited, presenting moderate discomfort in the calf, swelling of the ankle and blueness of the foot, all of which disappear upon rest and continue to recur upon use of the member, combined with a history of trauma, clearly constitute a distinct entity. As such it is either very rare or simply not recognized; the matter of rarity being more probable as Dr. Homans points out its high mortality. I have not recognized a case in kind and cannot, therefore, add enlightenment.

Femoral ligation is certainly indicated, once a diagnosis is established. I would like to ask Dr. Homans what his reaction would be when confronted with a typical case, and finding the affected leg the seat of saphenous disease or lacking a saphenous current.

I cannot help but feel that a patient who acquires a local, deep thrombosis in the leg brought on by such comparatively slight trauma must have either a strong predisposition to phlebitis or the vessels are primarily diseased.

During the course of his paper, Dr. Homans describes the clot in thrombophlebitis of varicose veins as usually quite well fixed. I agree with him yet would like to offer the following two cases briefly, where either the clot or the infectious process made rapid progress upward in the saphenous channel.

Worcester Memorial Hospital records Nos. 7919 and 8767, August and November 1933.

Case I. Female, aged 50, having moderate varicosities of the right leg supported by a bandage, fell while at work, striking her knee. A localized reddening and tenderness over the saphenous at this point developed. She was treated at home by her family physician. Nearly a month later a similar area appeared in the middle of the thigh. At this point I saw her and she was hospitalized for high saphenous ligation. On the following morning, however, she had developed a high temperature and went through the usual course of milk leg.

Case II. A steel worker, aged forty, struck his left leg below the knee. He had slight varicosities that had caused little or no trouble. At the point of injury a small reddened and tender area developed. This man, unlike the woman of Case I, continued work and had only mild febrile reaction and pain. A second area appeared above the knee and shortly after, a third in the upper third of the saphenous course, whereupon he consulted a physician and was sent to the hospital. The following day, a high ligation was done and the tender areas disappeared without further complications. Whether this man would have continued to a point of embolism or milk leg is a matter of conjecture.

In closing, I would like to say that it has always been a source of interest to me to note from my own cases and observation of others, the very low incidence, if not total absence of phlebitis, embolism and varicosities in childhood and early youth, in spite of their many injuries and share in the various operative procedures.

Does this indicate that as one matures, the wear and tear of advancing years, the incidence of infection and possibly further injuries make the adult more prone to phlebitis and its sequelae?

DR. ROBERT J. GRAVES, Concord, N. H.: Dr. Homans has again placed this Society in his debt by calling attention to an extremely important condition which is often inadequately treated. It really comes down to a question of tying off the femoral vein on slight provocation. If this is frequently done there will be, of course, a considerable number of needless operations, but, in situations such as Dr. Homans describes, a delay of even a few days may make the difference between life and death, and where an operation of so simple a character can be performed, I believe that it should be done as soon as the diagnosis is made.

During the past year I have had two cases, in one of which I adopted the waiting policy and the patient died from embolism after backing and filling with phlebitis for some ten weeks. In the second case I tied the femoral vein quite soon and the patient lived. There is, of course, no way of telling that the operation saved his life, but I certainly felt much more comfortable after it had been performed. It is obviously a question of getting a jump ahead of the embolus, and we must demonstrate more intestinal stamina in our treatment of these cases.

DR. HOMANS: Replying to Dr. Adams, I am aware of the fact that phlebitis in the varicose saphenous vein occasionally progresses into the femoral and in that case one is likely to see the typical milk leg. I have seen such patients and refrained from including those in this account.

Embolism occurs from the varicose saphenous vein very rarely and only occasionally is a life saved by operating on patients who are suffering from repeated infarctions. Actually the saphenous vein has nothing to do with the disease I am speaking of. It cannot even indirectly be the cause of those thromboses which begin in the muscular veins themselves.

CARCINOMA OF THE TONSIL*

A Statistical Study of Two Hundred and Thirty Cases

BY LE ROY A. SCHALL, M.D.†

MATERIAL

FROM 1918 to 1934, 230 patients with malignant disease of the tonsil were seen by the Laryngological Staff of the Collis P. Huntington Memorial Hospital. This paper is a statistical study of these records in an attempt to find some ray of hope in the treatment of this disease. In the same period of time 24,437 patients with malignant diseases were admitted to the Hospital, so that the incidence of tonsillar involvement is almost one in every one hundred and six cancer patients.

*From the Cancer Commission of Harvard University.
Read before the American Laryngological Association, Cleveland, Ohio—June 8, 1934.
I wish to express my indebtedness to Dr. Charles Dumas for his technical aid in describing "Treatment."

†Schall, LeRoy A. — Associate Surgeon, Massachusetts Eye and Ear Infirmary and Massachusetts General Hospital. For record and address of author see "This Week's Issue," page 1032.

Year	Cases
1918	14
1919	16
1920	9
1921	26
1922	21
1923	10
1924	17
1925	16
1926	13
1927	16
1928	16
1929	11
1930	14
1931	9
1932	11
1933	11
	230

The yearly incidence runs very evenly; twenty-six, the greatest number, were seen in 1921; the fewest, nine, each in 1920 and 1931; so that, apparently, in so far as this series is concerned, there is no evidence of an increase in the incidence of the disease.

NATIVITY

American	108
Canadian	22
Irish	35
English or Scotch	15
Scandinavian	3
German	4
Russian or Baltic	3
South or East Europe	11
Unknown	27

In the racial study of this disease, the incidence of occurrence is in direct proportion to the racial groups served by the Hospital. It is natural that at this hospital, the greatest group is found in those of American nativity, with those of Irish and Canadian ancestry forming the second and third groups in order of frequency.

OCCUPATION

Farmer or laborer	52
Skilled laborer	63
Factory worker	19
Clerk	8
Professional	11
Commercial	13
Transportation	10
Housewife	18
Domestic	6
None	7
Unknown	7
Other	16

It is natural also that the greatest groups should fall into the greatest social groups, i.e., the laborer and the skilled labor classes.

SEX

Male	203—88.7%
Female	27—11.3%

The incidence in the male sex is most striking, 203 males or 88.7 per cent, and 27 females or 11.3 per cent.

MARITAL STATUS

Single	36
Married	139
Widowed	45
Divorced	5
Unknown	5

AGE

30-40	4
40-50	19
50-60	72
60-70	86
70-80	38
80 and over	8
No record	3

The age group is that of past middle life. In the more detailed study, the greatest incidence is found in the group between sixty and sixty-five years of age; although two were below thirty-five, and eight over eighty years of age.

WEIGHT

In studying the weight charts of these patients, it is found that there is no one group that predominates. From ninety-six to two hundred and twenty pounds, the incidence of involvement differs but little.

LOSS OF WEIGHT

Fifty-three of these patients showed no loss of weight, thirty-three lost less than ten pounds; eleven up to twenty pounds; seven up to forty pounds, and one more than forty pounds in weight. Sixty-five stated that they had lost weight but were uncertain of the amount. Contrary to all expectations, five had gained weight, while fifty-five records made no mention of the weight of the patient.

FAMILY HISTORY

In only eighteen of these 230 patients was there a family history of cancer. Only eight gave a history of syphilis, while only seven had positive serological tests. Forty-two patients were non-users of tobacco.

TOBACCO

None	42
Pipe	27
Cigar	11
Cigarettes	7
Smokes (method not stated)	136
Chews	45
Unknown	12

In only forty-eight of these 230 cases, was the disease limited to the tonsil. I have made no attempt to determine the site of the primary lesion. In addition to the tonsil:

The palate was involved in	76	or 33. %
" pyriform sinus in	50	21.7%
" tongue	48	20.8%
" anterior pillar	34	14.7%
" postpharyngeal wall	18	7.8%
" post. pillar	18	7.8%
" lower jaw	8	3.4%
" upper jaw	8	3.4%

TYPE OF LESION

Examination showed the lesion to be ulcerated in ninety-eight; tumor in 132; to involve the right side in 127; the left in 103.

SYMPTOMS

The study of the patient's first symptoms shows that 104 had pain, eighty-four first complained of growth, four showed bleeding, nine had hoarseness, four ulceration, fourteen dysphagia, ten dysphonia, and only one leukoplakia.

DURATION OF SYMPTOMS

Less than 2 weeks	4
15 to 30 days	14
31 to 90 days	65
3 to 6 months	70
6 to 9 months	22
9 to 12 months	28
13 months to 2 years	10
Over 2 years	10
Unknown (no record)	7

In a region as easily examined under direct vision as the throat, it is surprising that these patients endured their symptoms on an average of three to six months before consulting a physician. Only four sought advice in less than two weeks. Many waited until enormous cervical metastasis occurred. In the over two year group, these had undergone previous treatment elsewhere, and came for re-occurrence.

PREVIOUS STUDY

None	101
Yes	129

Although 129 were referred to the Hospital by physicians, only forty-four received prior treatment. An analysis of this treatment showed that there was a local operation on the growth in twenty-seven cases; radical neck dissection on two; incomplete neck dissection on four; radium was used on fifteen and deep x-ray radiation on seventeen. Five were treated for syphilis.

GLANDS

Glandular enlargement occurred fairly early. Only nineteen showed no evidence of glands. Their distribution showed enlargement, on the right seventy-five, left sixty-nine, both sides twenty-two; submental two, submaxillary forty-five. The glandular enlargement varied from small palpable glands to tremendous masses in the neck, of which there were forty-one cases.

PRE-TREATMENT COMPLICATIONS

None	167
Old age	34
Heart, arteriosclerosis	13
Nephritis	1
Diabetes	4
Malnutrition	4
Anemia	1
Other disease	6

PATHOLOGY OF TUMOR

Epidermoid carcinoma	Grade I	38	24.09%
" "	Grade II	57	37. %
" "	Grade III	52	33.7%
Transitional cell carcinoma		7	4.5%
Ungraded		76	

As this study included cases prior to Broders'[1] classic classification of malignancy, seventy-six cases are listed as ungraded.

TREATMENT

Since 1918 the treatment of malignant disease of the tonsil has passed through three distinct phases. The first may be said to be that of surgery. The surgical procedures varied from simple enucleation of the tonsil to that of ligation of the carotid, radical neck dissection and a wide radical dissection of the growth. With the advent of electrosurgery, diathermia and electrocoagulation have replaced the scapel.

During the past three years at this hospital the treatment consists of the combined use of radium and high voltage Roentgen ray therapy. Radium is used for the treatment of the local lesions and x-ray for the external radiation of the neck. The radium treatment always consists of radon implants in the form of gold seeds, having the wall thickness of .2 mm. offering a filter sufficient to remove practically all beta radiation. These seeds are dispersed throughout the local lesion, an effort being made to place them in such a way that the lesion will receive uniform irradiation. By placing the seeds as nearly as possible 1 cm. apart, all portions of the lesions will receive a radiation of nearly uniform density, which can be varied to suit the case by using seeds of different contents of radon.

As a rule, radon seeds of 1 mc. strength are employed. This, however, should not be made a strict rule. The total amount of radon used has varied from 2 to 12 mc. according to the size of the lesion. From time to time definite recommendations as to the dosage have been made in various clinics. In this group of cases a rigid rule has not been followed, particularly in cases with large lesions the dosages have been very much less than those recommended. In the use of radium we should always remember that a caustic effect is produced, not because the caustic rays have not been filtered, but because the biological effect in the immediate vicinity of the radium implant is so great that normal tissue and tumor tissue are destroyed. The extent of the slough depends on the strength of the radium seed. The same is true in the cases of other forms of radium implants, if too large doses are used in too small areas.

The external radiation is given through the use of short wave Roentgen ray produced at 190 kilovolts constant potential, and filtered through copper of ½ mm. thickness. The skin focal dis-

tance is 45 cm. It is felt that the neck can be irradiated satisfactorily in this manner, and much more easily and effectively than with the use of external radium pack. The use of radium bomb such as is advocated in various clinics where a large amount of radium is available, has not been tried here, because of the insufficient amount of radium.

Only one side of the neck, the affected side, is exposed, unless it is felt that the disease has extended to the other side of the neck. The doses range from 2000 r to 4000 r units. The international r unit is used, and the measurements given are those taken in air. In this way a mild erythema can be produced by giving 800 r units at one sitting. The total dose is given in fractional amounts of 300 to 600 r units over a period of from five to forty days. A dose of 2000 r units given in 400 r units amounts on successive days is perhaps the least from which we can expect results.

Commonly we have given an initial dose of 2000 r units, then allowed a period of two to three weeks to elapse to judge the amount of regression in the tumor, if any, and also, the local and general reaction. If the response to treatment in the growth has been sufficient and the condition of the patient has remained good, the treatment has been extended and as much as 4000 r units have been given in forty days without producing loss of more than the superficial layers of the skin.

External radiation is usually carried out in the week following the insertion of the radium implants. Occasionally where the primary tumors have been of very large size, external radiation has been given first in an attempt to produce some diminution in the size of the tumor, and permit more effective use of local treatment by radium.

SUMMARY OF TREATMENT

No treatment	13
Treatment, not completed	99
Operation and radium	10
Operation and x-ray	4
Radium and x-ray	104

Thirteen patients received no treatment. They came either for diagnosis or confirmation of the diagnosis. Ninety-nine did not complete their treatment. These were the patients that were hopeless when first seen. Ten were treated by operation followed by radium, while four received deep x-ray therapy following operation. One hundred and four have been treated by radium implantation followed by deep x-ray. The results of this study are based, therefore, on 118 treated cases.

RESULTS

No relief	43	39.3%
Relieved, no recurrence	23	18.4%
Recurred under 1 year	47	39.8%
Recurred in 1-2 years	2	1.01%
Recurred in 2-5 years	2	1.01%
Recurred after 5 years	1	.5%

Of the twenty-three patients who have had no recurrence, five have died a non-cancerous death.

The end-results of all cases as of January, 1934 show the following:

Dead	202
Lost	6
Living	22

Of the twenty-two patients now living, eighteen are without clinical evidence of cancer.

Year	Number of Cases	Number Healed	Per Cent	Duration
1921	26	1	3.8%	12 years
1924	17	1	5.8%	9 "
1925	16	1	6.2%	8 "
1928	16	1	6.2%	5 "
1929	11	1	9. %	4 "
1931	9	3	33⅓%	2 "
1932	11	5	45.4%	1 "
1933	11	5	45.4%	Less than 1 year

From a statistical point of view these percentages compare favorably with those of Berven[2] and Coutard[3].

Clinically, the results of treatment are most encouraging; even though a "cure" may not always be obtained.

It is our experience that this method of treatment produces the quickest results without incapacitating the patient or subjecting him to a long hospitalization.

CONCLUSIONS

1. In certain selected cases, surgery may still have a place in treatment of malignant disease of the tonsil.

2. When the lesion has spread beyond the tonsil, the combined use of radon implantation and external irradiation has given us our most encouraging results.

REFERENCES

1 Broders, A. C.: Squamous-cell epithelioma of the lip. J. A. M. A. 74:656, 1920.

2 Berven, E. G. E.: Malignant tumours of tonsil. Acta radiol., Supp. 11:1, 1931.

3 Coutard, H.: Roentgentherapie des Epitheliomas de la region amygdalieme. Radiophys. et Radiotherapie. 2:541, 1930-32.

THE HETEROPHILE AGGLUTINATION TEST IN THE DIAGNOSIS OF INFECTIOUS MONONUCLEOSIS*

BY A. C. VAN RAVENSWAAY, M.D.†

INFECTIOUS mononucleosis has remained an occasional cause of at least temporary confusion in diagnosis since Türk[1] in 1907 reported a case which he had confused with leukemia. It is the purpose of this paper to discuss the diagnostic difficulties in the identification of this disease and the confirmatory value of the heterophile sheep cell agglutination test.

THE HETEROPHILE AGGLUTINATION TEST

In 1911 Forssman[2] demonstrated that the injection of antigenic material from a group of animals including the guinea pig and horse (subsequently known as the guinea pig group) into one of a second group of suitable animals, including the rabbit, resulted in the production of hemolysins and agglutinins for sheep cells as well as specific antibodies for the injected substance. Such antigens are now referred to as Forssman's antigens and the antibodies produced by them for sheep cells are termed heterophile antibodies. These antibodies have been demonstrated by Davidsohn in people who have received horse serum[3] and to a higher titer in cases of serum sickness[4]. While investigating this type of heterophile antibody in sera from patients with different diseases Paul and Bunnell[5] in 1932 found that sera from cases of infectious mononucleosis agglutinate sheep cells to a distinctly higher titer than do sera from normal individuals or those who have received horse serum and is equaled only by sera from certain cases of serum sickness. In a series of 2000 controls, including sera from a wide variety of disease processes, anti-sheep agglutinins were found to be either completely absent or present in very slight concentration[6]. Paul and Bunnell, therefore, feel that this is a useful method for the diagnosis of infectious mononucleosis and have described a technic for its practical application[5, 6]. Rosenthal and Wenkebach[7], using the same method, have demonstrated its value in distinguishing infectious mononucleosis and other blood dyscrasias. Its use as a diagnostic criterion is also referred to in recent Scandinavian literature[8]. Further confirmation has appeared in reports by Boveri[9] and by Bernstein[10].

The test has been used in this hospital since July, 1933 and is regarded as having clinical value. The method used is that described by Bunnell[5, 6]. The results in sixteen cases of infectious mononucleosis which have come under observation are summarized in table I.*

In another group of twenty-one patients infectious mononucleosis was suspected clinically but the test was negative or agglutination was present in very low titer. Subsequent events indicated that these were probably not cases of infectious mononucleosis. The sera from forty patients with positive Hinton tests were negative. The results in a number of blood dyscrasias are summarized in table II.

In four hundred and fifty control sera consisting for the most part of those coming to the Wassermann laboratory there was seldom more than partial agglutination at the lowest dilution. In three cases complete agglutination was obtained at a serum dilution of 1:16. One of these patients had recently received horse serum. Information could not be obtained concerning the other two. In twelve cases complete agglutination was present at a dilution of 1:8. In this connection it is interesting to note the relationship between the age of the sheep cells used and the titer to which these non-specific reactions occur. Three sera, which gave complete agglutination at a dilution of 1:8 during a series of routine tests, were retested with sheep cells less than twenty-four hours old which had been rewashed immediately before using. The cells were returned to the refrigerator and the test was repeated on the first and third following days without rewashing the cells. The same positive control was used in each case. The results are given in table III. In one instance in attempting to use old cells a positive serum gave a negative reaction.

In general our findings have confirmed those of Bunnell. In several instances the test was performed during the first few days of the onset of symptoms of infectious mononucleosis and in all sixteen cases the titer in the first serum examined was never exceeded in subsequent specimens.

After the onset of symptoms the test remains positive to a fairly high titer for a number of weeks and gradually falls off to become negative in about six months. In this way it roughly tends to parallel the course of the atypical lymphocytes in the blood. In other respects, however, no relationship can be demonstrated as the titer to which agglutination was obtained did not necessarily parallel the course of these cells in the blood, nor was it proportional to their absolute number. One of the highest titers obtained was associated with leukopenia and a

*From the Pathology Laboratories of the Massachusetts General Hospital.

Read before the Boston Pathological Society, May 7, 1934.

†Van Ravenswaay, A. C.—Assistant in Medicine, Washington University School of Medicine. For record and address of author see "This Week's Issue," page 1032.

*A number of these cases were tested through the courtesy of Dr. E. H. Place of the Boston City Hospital.

TABLE I

		1:8	1:16	1:32	1:64	1:128
(1) Medical student	7-21-33	+++	+++	+++	+++	+
	8-5-33	+++	+++	+++	+++	+
	3-5-34	—	—	—	—	—
(2) Nurse	7-24-33	+++	+++	+++	++	++
	9-25-33	+++	+++	++	++	—
	5-1-34	—	—	—	—	—
(3) Patient	8-9-33	+++	+++	+++	+++	+
	8-17-33	+++	+++	+++	++	—
(4) Patient	8-12-33	+++	+++	+++	+++	+++
(5) Patient	12-24-33	+++	+++	+++	+++	++
	1-3-34	+++	+++	+++	+++	++
(6) Hospital social worker	12-29-33	+++	+++	+++	+++	++
	1-6-34	+++	+++	+++	++	+
	3-5-34	+++	+++	++	—	—
	5-1-34	+++	+++	+	—	—
(7) Nurse	1-3-34	+++	+++	+++	++	—
(8) Technician	1-10-34	+++	+++	+++	++	++
	1-29-34	+++	+++	+++	++	—
	3-5-34	+++	+++	++	++	—
	5-1-34	+++	+++	++	—	—
(9) Doctor's son	4-8-34	+++	+++	+++	+++	+++
(10) Doctor	4-10-34	+++	+++	+++	+++	++
(11) Doctor's wife	4-13-34	+++	+++	+++	+++	+++
(12) Technician (convalescent)	4-13-34	+++	+++	++	+	—
(13) Patient (convalescent)	5-1-34	+++	+++	++	++	—
(14) Patient	5-16-34	+++	+++	+++	+++	+++
(15) Patient	5-27-34	+++	+++	+++	+++	++
(16) Patient	6-10-34	+++	+++	+++	+	—

Table I. The occurrence of sheep cell agglutinins in sixteen cases of infectious mononucleoses. The periodicity of occurrence and tendency to occur in individuals associated with the medical profession are shown. +++ indicates complete agglutination.

TABLE II

	No. of Case	1:8	1:16	1:32	1:64
Acute Leukemia	1	—	—	—	—
	2	++	—	—	—
	3	—	—	—	—
Chronic Myelogenous Leukemia	1	—	—	—	—
	2	++	—	—	—
	3	—	—	—	—
	4	—	—	—	—
	5	—	—	—	—
Chronic Lymphatic Leukemia (including two cases of lymphosarcoma with atypical cells in the blood)	1	—	—	—	—
	2	+++	++	—	—
	3	—	—	—	—
	4	++	—	—	—
	5	—	—	—	—
	6	—	—	—	—
Monocytic Leukemia	1	+++	+++	++	—
Aplastic Anemia	1	—	—	—	—
	2	—	—	—	—
Polycythemia	1	++	+	—	—
	2	—	—	—	—
Pernicious Anemia	1	—	—	—	—
Erythroblastic Anemia	1	—	—	—	—
	2	+	—	—	—
Sickle Cell Anemia	1	—	—	—	—
Hemolytic Icterus (acquired)	1	—	—	—	—
Thrombocytopenic Purpura	1	—	—	—	—
Agranulocytic Angina	1	—	—	—	—
	2	—	—	—	—

Table II. The presence of sheep cell agglutinins in other blood diseases than infectious mononucleosis.

differential count of only fifty-eight per cent mononuclear cells of all types including eighteen per cent atypical lymphocytes. Furthermore, during the course of the disease in the cases which we were able to follow, the agglutinins were maximal in the first serum tested, whereas the peak of lymphocyte rise did not occur for several days.

At present the greatest difficulty in interpreting the heterophile reaction consists in deciding to what titer agglutination must be present before a positive diagnosis can be made on the basis of this test alone. In making such a decision both the agglutinins which may be normally present and those caused by other conditions must be considered. To date the only other known cause of significant amounts of cases which clinically and hematologically were consistent with infectious mononucleosis and in which they interpreted the heterophile agglutination test as negative. They suggest that this group represents cases of glandular fever which they differentiate in this way from infectious mononucleosis. Twenty-one cases have been examined at this hospital which at the time clinically suggested the latter disease and in which the test revealed either no agglutination or in a few cases agglutination ranging from partial at a 1:8 dilution to complete at 1:16 in one case. Many of these were subsequently considered as a simple sore throat with palpable nodes and a slight mononuclear response in the blood. In others, subsequent events indicated different diagnoses. In a few cases the patient recov-

TABLE III

Date	No. of Serum	1:8	1:16	1:32	1:64	1:128
8/24	Pos. control	+++	+++	+++	+++	+++
	62	—	—	—	—	—
	65	—	—	—	—	—
	68	—	—	—	—	—
8/26	Pos. control	+++	+++	+++	+++	++
	62	++	—	—	—	—
	65	+	—	—	—	—
	68	+++	+++	++	—	—
8/27	Pos. control	+++	+++	+++	+++	++
	62	+++	—	—	—	—
	65	+++	+++	++	—	—
	68	+++	+++	+++	++	—

Table III. Illustrates the relationship between the age of the sheep cells used in the test and the occurrence of non-specific reactions.

sheep cell agglutinins in the blood is the parenteral injection of material from the guinea-pig group of animals which in actual practice consists almost entirely of horse serum. Agglutination of sheep cells to high dilution has not been demonstrated in allergic individuals. In one patient who reacted to an intradermal skin test with horse serum diluted 1:10,000,000, sheep cells were completely agglutinated to a dilution of only 1:16. As previously mentioned, occasional cases were encountered in the control series in which complete agglutination occurred at a titer of 1:16 in apparently normal individuals with no proved history of exposure to horse serum. It has been our practice not to consider a reaction diagnostic unless agglutination was complete to a dilution of 1:32 while in the usual acute case a higher titer was obtained. Both Bunnell and Bernstein include in their series of positive cases a group in which during the acute stage of the disease agglutinins were present to titers of only 1:4, 1:8, and 1:16. Such reactions cannot be considered diagnostic and if these cases represent true instances of infectious mononucleosis, a negative test is of very little value in ruling out the disease. Rosenthal and Wenkebach describe a group of ered and no specific diagnosis was made. Because of the clear-cut nature of the reaction in our positive group of cases and because of the lack of a convincing clinical picture, we have felt without complete justification that this undiagnosed group probably did not represent cases of infectious mononucleosis, although as has been stated, Bunnell and Bernstein include what may be similar cases in their series.

SIGNIFICANCE OF THE HETEROPHILE REACTION

Two possible explanations have been suggested for the presence of sheep cell agglutinins in the sera of patients with infectious mononucleosis, the more obvious one being that the etiological agent of the disease whether bacterial or virus in nature serves as a heterogenic antigen in their production. As a precedent in such an assumption is the fact that the Shiga dysentery bacillus has been demonstrated to contain Forssman's antigen[12, 13, 14]. An additional example of such a mechanism has been recently furnished by Buchbinder[15] who describes heterophile antibodies produced by organisms of the Genus, *pasteurella,* which agglutinate avian erythrocytes.

In contrast to this hypothesis, Meyer[16] believes that the agglutinins normally present are

merely increased in infectious mononucleosis. A similar type of increased serological reaction has been noted in Berlin where it has been found that frequently the sera of pregnant women agglutinate the Y-dysentery bacillus in high titer[17].

In attempting to determine if other antibodies in the blood are increased in infectious mononucleosis, we determined the diphtheria antitoxin content of the sera in four cases in which the heterophile agglutination test was strongly positive by intracutaneous titration in guinea pigs. In none of them was the antitoxin content so high as is usually present in the sera of Schick negative individuals. Until the cause of infectious mononucleosis and the details of its pathological process are known, it is impossible to proceed further in explaining the reaction, and the latter must be used as an empirical procedure. It is similar in this respect to the Wassermann reaction in syphilis and to the Weil-Felix reaction in typhus fever.

CONCLUSIONS

(1) A positive heterophile agglutination test is of practical value in the diagnosis of infectious mononucleosis.

(2) The value of a negative or weak reaction is as yet uncertain.

REFERENCES

1 Türk, W.: Septische Erkrankungen bei Verkümmerung des Granulozytensystems. Wien. klin. Wchnschr. 20:157, 1907.

2 Forssman, J.: Die Herstellung hochwertiger spezifischer Schafhämolysine ohne Verwendung von Schafblut. Biochem. Ztschr. 37:78, 1911.

3 Davidsohn, I.: Heterophile antigens and antibodies. Arch. Path. 4:776, 1927.

4 Davidsohn, I.: Further studies on heterophilic antibodies in serum sickness. J. Immunol. 18:31, 1930.

5 Paul, J. R., and Bunnell, W. W.: The presence of heterophile antibodies in infectious mononucleosis. Am. J. M. Sc. 183:90, 1932.

6 Bunnell, W. W.: A diagnostic test for infectious mononucleosis. Am. J. M. Sc. 186:346, 1933.

7 Rosenthal, N., and Wenkebach, G.: Die Bedeutung der Heterophilen Antikörperreaktion für die Diagnose der Infektiösen Mononucleose. Klin. Wchnschr. 12:499, 1933.

8 Olesen, M.: Two cases of infectious mononucleosis in sisters diagnosed by vital staining and by the heterophile antibody reaction. Ugesk. f. Laeger. 96:158, 1934.

9 Boveri, R.: Über das Vorkommen Heterophiler Antikörper bei Lymphoidzelliger Angina. Klin. Wchnschr. 12:666, 1933.

10 Bernstein, A.: Antibody responses in infectious mononucleosis. J. Clin. Investigation. 13:419, 1934.

11 Ordway, T.: Oxford Monographs. 9:394, 1930.

12 Iijima, T.: The presence of heterophile antigen in bacteria. J. Path. & Bact. 26:519, 1923.

13 Meyer, Kurt.: Zur Kenntnis des heterogenetischen Antigens in Shiga-Bazillen. Ztschr. f. Immunitätsforsch. u. exper. Therap. 45:97, 1925.

14 Jungeblut, C. W., and Ross, A. T.: On the presence of heterophile (Forssman's) antigen in bacteria of the paratyphoid-dysentery group. J. Immunol. 16:369, 1929.

15 Buchbinder, L.: A new heterophile antigen common to avian erythrocytes and some varieties of genus pasteurella. J. Immurol. 26:215, 1933.

16 Meyer, K.: Zur Deutung der abnormen Hämagglutininvermehrung bei menschlichen Seren. Med. Klin. 29:981, 1933.

17 Loewenthal, Waldemar: Erklärungsversuche für die Ruhragglutination durch Schwangerenserum. Ztschr. f. Immunitätsforsch. u. exper. Therap. 30:439, 1920.

INDUSTRIAL SURGERY

BY FREDERIC J. COTTON, M.D.,* AND GORDON MACKAY MORRISON, M.D.*

THE matter of traumatic surgery is much in evidence to-day, and lately the question of who shall do industrial, which is to say traumatic surgery, is pertinent. Various groups are agitating the matter, contending on the one side for "free choice" by the injured, which means choice of any doctor, regardless of classification and qualifications; the others contending for preference in favor of men of definite surgical training and proved efficiency.

Massachusetts has "free choice", but in practice it is distinctly limited free choice, beyond argument. On the whole the arrangement seems not to have worked out badly for the injured, and has brought millions into the pockets of the profession. Just now many doctors want absolute free choice, the insurance "carriers" want their choice, and back of it all we have collective industry groaning under yearly mounting medical and hospital costs, about at the limit of financial endurance for a burden that was not crushing back in 1928.

There are definitely two sides to the question. When "free choice" was accepted in Massachusetts it was as an open choice for the lesser of two evils. In those years there had been company abuses, commercial exploitation of doctors, a lot of work not so good; but it was recognized even then that absolute free choice would bring abuses, and that major injuries could not uniformly obtain expert handling from men under the conditions of ordinary private practice. But at that time "free choice" was decreed and since then modified in daily practice by a number of factors.

Very lately there has appeared a Bulletin published by the American College of Surgeons. It is interesting because in the first place it gives an admirable study of the history of compensation, the facts of its actual working. This presentation is based on eight years of study by the Board on Industrial Medicine and Traumatic Surgery of the College, and much labor by Dr. Newquist, investigator for the Committee, who gathered the material for this report.

In the second place, and more important, the College has gone into the constructive side of the question, has indicated quite definitely the desirable organization of medical service for industries, the qualifications of the medical men to give this service.

This is new, no doubt controversial.

The American College of Surgeons was conceived in the beginning to raise standards of surgical knowledge and practice, and has for twenty years dedicated itself to this end, not

*Cotton, Frederic J.—Consulting Surgeon, Boston City Hospital. Morrison, Gordon Mackay—Assistant Out-Patient Surgeon, Boston City Hospital. For records and addresses of authors see "This Week's Issue," page 1032.

without effect. Particularly, has it done great good in raising hospital standards throughout the country. Therefore, it deserves to have its conclusions in this matter very carefully considered, remembering that it has always been the champion, not of the purest democracy, but of service to the people by the best of the profession.

Excerpts from the Bulletin should be of interest:

"The advent of Workmen's Compensation Laws into the United States in 1911 placed a definite economic value upon bodily injury or loss of time suffered by an injured workman and gave a new impetus to a medicine and surgery in industry which resulted in its widespread use as a measure of economy.

"The primary goal of the compensation law was to provide automatic and prompt financial relief to the injured workman at a time when it was most needed. Industry immediately set about to reduce this added and fixed expense by prevention of accidents and by providing better medical and surgical care to reduce the disability and time lost. While the repair of injuries was an immediate requirement, physicians and industrial leaders, alert to the presence of indirect costs, extended considerably the scope of their medical service by the adoption of preventive measures. Diagnosis, first aid treatment with advice for illness on duty, and coöperation with the employee's private physician have become routine daily procedures.

"Many industrial organizations have found that an efficient and unbiased medical service has promoted good will and mutual protective interest between the employer and the employee.

"In a study of the medical services of 52 companies in 1932, the American College of Surgeons found that there were twice as many lost time injuries in plants of less than 500 workers as in those having 1,000 employees. In the same study the days lost from injury in the smaller plants were almost three times as many as those in the larger ones.

"The higher accident rates of the smaller industrial units are due principally to three factors: first, a greater diversification of duties; second, lack of adequate safety measures; and third, lack of adequate medical service.

"Dr. Carey P. McCord estimates that prevention of infection alone would reduce the time lost from all normal causes by at least one-third.

"The length of hospitalization of injured workers employed in plants of less than 250 employees was 18 per cent greater than that experienced by companies of 1,000 or over. It is apparent that even the length of hospitalization of injured workers reflects the need for better medical service in the small plant.

"It is obvious that the larger companies owe much of their splendid accomplishment to the fact that their organized medical service has kept the minor injuries from becoming major ones. The local county medical societies could well coöperate with the smaller industrial organizations and even take the initiative in promoting a plan to provide adequate medical service.

"In isolated communities or camps it may be necessary to provide complete medical and hospital service for employees and their families while the organizations located in cities can draw upon the available local service. Recent experiences have clearly demonstrated that in so far as practicable it is the part of economic wisdom for industry to follow the latter plan.

"The number of employees, the type and location of the industrial establishment, the nature of the work, and the extent of the medical program determine the space and equipment requirements for the medical department. In the case of several railroad companies, company or employee hospitals were built on account of their medical program. Mining and lumber camps are usually obligated to provide extended medical service on account of their isolation. Public utilities, department stores, and banks, maintain medical departments that compare favorably with private offices and clinics in point of space, equipment, and furnishings. There are, however, some public utilities and others whose personnel and activities are so decentralized that no medical department or dispensary is maintained. First aid kits are generally carried on the motor trucks used by their working crews, and the nearest medical and hospital service is utilized as needed.

"Dr. Davis, of the Illinois Steel Co., Chicago, says: 'Patients with severe injuries should be transported to a dispensary or hospital where proper surgical treatment can be given. Only the minimum treatment should be given before the patient is transported. Transportation of minor injury cases to a dispensary or hospital and treatment by a surgeon are preferable to first aid treatments by first aid persons throughout the plant.'

"Dr. Robert H. Kennedy summarizes the advantages of transportation in traction as follows:—

'For the patient it decreases danger of further injury, increases comfort, and lessens shock.

'For the surgeon it simplifies reduction after the patient's admission to the hospital. We rarely see patients in whom there is any overriding of fragments as shown in the x-ray taken on arrival.

'For the hospital as well as the patient it shortens his stay by promoting earlier union and there is less danger of non-union.

'From the economic viewpoint the expense to industry is diminished because the injured man spends fewer days in the hospital and returns to work more quickly.'

"Many small industrial establishments have not yet fully appreciated that the cost of a few injuries during the year is relatively high in comparison to hours worked.

"Dr. Carey P. McCord, Medical Director, Industrial Health Conservancy Laboratories, records his findings as follows:

'Left to the devices and administration of the layman, industrial injuries will so frequently become infected as to account for approximately 35 per cent of lost time for all normal causes. If effectively cared for in a medical department, this cause of lost time may be reduced to approximately 0.5 per cent of the total.'

"It is quite impossible for the smaller plants to have individual medical departments, since their costs per capita go up as the total number of employees decrease. For this reason group medical service has been found profitable. Groups of industrial organizations occasionally unite to set up a central clinic. Private, insurance company, or hospital clinics have been set up to serve groups of industries. The general practice of the smaller plants, however, is to use the medical service as arranged by the insurance carriers with private practitioners or clinics.

"Insurance companies have set up clinics and hospitals to treat cases of those insured. In later years they have found that the use of the best surgeons whose individual fees may be higher is the most economical in the final analysis both as to total fees, and the early return to work of the injured employee.

"No plan for medical service is wholly satisfactory unless responsibility is fixed at some one point

and active medical supervision is extended to include all plant activities. If this is not done the facilities for service can still be catalogued as repair stations only. In the smaller plants some physician must be designated to attend to the early treatment of injuries in order to reduce the infections, to institute other preventive measures, to see that the injured worker is cared for by one who is competent in industrial medicine or traumatic surgery, and to follow the case until he is back on the job. This supervision may come from an individual physician serving a group of industries or from some arrangement with the county medical society. This plan is most worthy of consideration.

"If the interest of the injured worker is placed foremost, the choice of the surgeon is thereby limited to those who are competent in traumatic surgery. The medical profession should be willing to coöperate with industry in some plan to provide adequate surgical service.

"The American Association for Labor Legislation states:

'Restored earning power is of more importance than distress relieved. The administrative board should therefore be authorized to encourage, coöperate with, or conduct enterprises for the reëducation and rehabilitation of injured persons.'

"In only two states (Massachusetts and Rhode Island) is a free choice of doctor given to the individual injured by direct expression in the statutes. California, Nebraska, and Wisconsin extend a partial or limited choice of doctor. Ohio and Utah do not specify as to choice of doctor but simply fix the responsibility as to the costs of such services.

"The accepted standard (generally so stated in the acts) for fees and charges for medical, surgical and hospital services, is the same as that which prevails in the community for similar treatment of ill or injured persons of like standard of living. For many years some industries and insurance carriers took advantage of this standard and sent their injured employees to hospitals as ward patients in order to obtain free treatment. The commission may formulate its own rules and regulations and draw up a schedule of fees, or it may determine the reasonableness of fees without a schedule.

"The arbitrary limitations that are established are, no doubt, a barrier to excessive fees on the part of the physician. On the other hand, such medical service as is limited to two weeks or thirty days is, in many instances, a grave injustice to the injured workman. In some highly industrialized states, payment for medical service is terminated after thirty days, which is permissible by law, but the doctor who usually thinks more of the welfare of his patient than of his fee continues to render service. Such flagrant imposition on the altruism of the medical profession is a violation of a principle that must and will right itself.

"Doctors and hospitals now receive a total of $72,000,000 per year through the compensation acts. This added cost for medical care was not without opposition from employers and insurance companies.

"The restoration of earning power through rehabilitation of injured workers serves both a humanitarian and an economic purpose. New Jersey in 1919 was the first state to pass a law which provided funds for rehabilitative purposes. In 1920 a federal enactment provided funds to match state funds to carry out this splendid work. Unfortunately, this program at first consisted mainly of vocational and educational work—ignoring the important factor of rehabilitation through medicine and surgery. Forty-four states and the District of Columbia now have made provisions for rehabilitation. Each industrial organization, however, should feel its responsibility towards its own employees and should not send its cripples to the state organization with their hats in their hands until its own sincere efforts towards physical and vocational restoration have failed.

MINIMUM STANDARD

"1. The industrial establishment shall have an organized medical department, or service, with competent medical staff including consultants and also shall have adequate emergency, dispensary, and hospital facilities and personnel to assure efficient care of the ill and injured.

"2. Membership on the medical staff shall be restricted to physicians and surgeons who are (a) graduates from an acceptable medical school, with the degree of Doctor of Medicine, in good standing and licensed to practice in their respective states or provinces, (b) competent in the field of industrial medicine and traumatic surgery, (c) worthy in character and in matters of professional ethics; in the latter connection the practice of the division of fees, under any guise whatsoever, shall be prohibited.

"3. There shall be a system of accurate and complete records filed in an accessible manner, such records to include particularly a report of injury or illness, description of physical findings, treatment, estimated period of disability, end results, as well as other information pertinent to the case or required by statute for Workmen's Compensation claims or other purposes.

"4. All patients requiring hospitalization shall be sent to institutions approved by the American College of Surgeons.

"5. The medical department or service have general supervision over the sanitation of the plant and the health of all employees."

This matter of proper quality of service to injuries in industry is almost as complicated as it is important, owing to the wide variance of the conditions in the various commonwealths, and even in the limits of one commonwealth. It is perfectly evident that the standard and quality of work needs raising and that there has been some exploitation. Far too many cases have been treated in routine fashion with little result and perhaps not much planning, but at an expense which is a large burden on the community and directly on industry.

This sort of routine "hit or miss" treatment is by no means unknown in cases of patients in the hands of general practitioners. It is rather usual in the private clinics and in the larger hospitals, where the major work is usually admirably done. After-care is apt to be allowed to drift into the hands of interns and into the rather loose organization of out-patient clinics.

There is definite question whether treatment of these cases, as they run, large and small, in the important hospitals is any better than the average in the hands of the outside practitioner. The incidence of sepsis is pretty certainly lower, but on the other hand personal interest in the patient and in his recovery is apt to be much less and the absence of any definite personal responsibility makes for inefficiency—altogether apart from the question, a very important one, as to whether endowed or supported hospitals have any right, in common decency, to come into open competition with the practitioner.

Consideration of all these items confirms what we have all known, that the present situation needs mending and such efforts as that of the American College to raise the standard of work are useful and necessary.

As yet, it is not certain that we should adhere to any one plan of organization. What may be best in Illinois may be worthless in Massachusetts or the South, and what may work out perfectly well in Boston, may not suit the needs in Fall River at all.

What is perfectly clear is, in the first place, that the technical handling of injury cases should be in the hands of men competent to handle them and that in some fashion we should have a concerted effort to get the men back on the job with the best and earliest recovery possible.

THE AUSTIN-FLINT MURMUR AND ITS DIFFERENTIAL DIAGNOSIS*

BY CLIFTON B. LEECH, M.D.†

DR. Austin Flint, in 1862, in the *American Journal of the Medical Sciences,* described mitral diastolic murmurs in two patients in whom aortic insufficiency was found to exist at post-

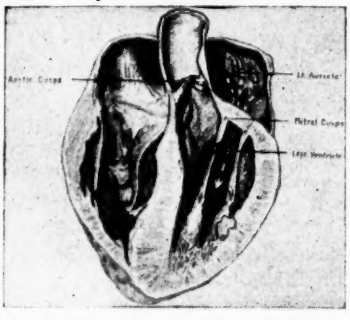
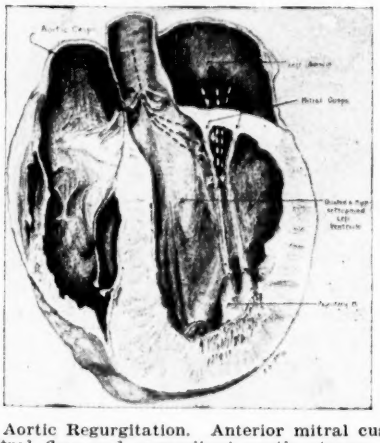


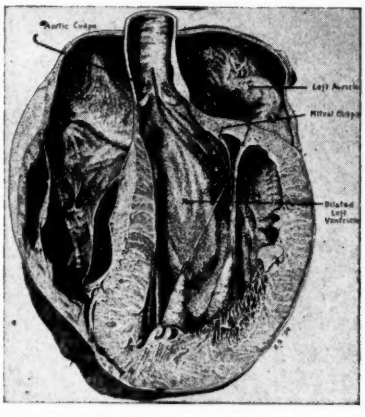
FIG. 1. The Normal Heart. Note competent aortic valve and free mitral flow from left auricle to left ventricle. Heart in diastole.



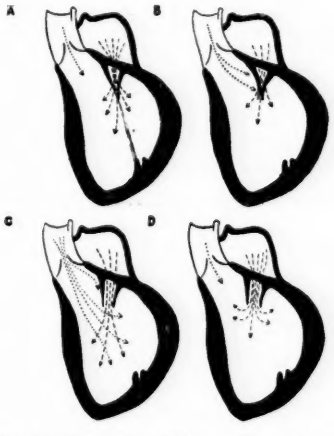
Heart in Aortic Regurgitation. Anterior mitral cusp vibrates between mitral flow and regurgitant aortic stream. Heart in diastole.

mortem examination without mitral disease. Such a murmur has been called the Austin-Flint murmur: when accompanied by a thrill it has been called the Austin-Flint phenomenon.

Austin Flint explained the phenomenon as due to distention of the ventricle (from the regurgitant stream) sufficient to bring the mitral curtains into coaptation, with the mitral direct current which passes between them throwing them into vibration and causing the murmur.



Anterior cusp of mitral valve pushed back by regurgitant aortic blood causing functional mitral stenosis. Heart in diastole.



Diagrammatic résumé of possible causes of an Austin-Flint murmur. Left ventricle of dilated heart during diastole. A. Mitral cusps pulled together, mitral flow causes vibration. B. Anterior cusp pushed back, mitral flow causes vibration. C. Anterior cusp vibrates between the two flows, and they are heard as they commingle. D. Sound of dilating mitral stream. ·····→ Aortic regurgitant flow. - - - -→ Mitral flow.

More recent theories: (1) the regurgitant stream impinges on the anterior cusp of the mitral valve, forcing it back and producing a functional stenosis at a time in diastole when

*Read before the New England Heart Association, May 21, 1934, at Peters House, Rhode Island Hospital, Providence, R. I.
The author is indebted to Dr. Eric Stone of Providence for the sketches and diagram.

†Leech, Clifton B.—Cardiologist, Union Hospital, Fall River. For record and address of author see "This Week's Issue," page 1032.

the blood stream is pouring from auricle to ventricle: (2) the murmur is produced by the contact of the two streams from the aortic and mitral valves pouring together into the left ventricle with the anterior cusp of the mitral valve vibrating between them: (3) the left ventricular dilatation is sufficient in degree to give rise to a murmur when the calibre of the blood stream coming through the normal mitral valve suddenly widens out.

In 1901 the late Dr. Thayer published in the *American Journal of the Medical Sciences* the characteristic signs of the Austin-Flint phenomenon. From his paper and from a study of approximately forty autopsied patients with the Austin-Flint murmur or with aortic insufficiency plus true mitral stenosis, I have constructed the following table of differential diagnosis between the Austin-Flint phenomenon and combined aortic insufficiency with mitral stenosis.

	A. I.—Austin-Flint Murmur	A. I. plus M. S.
1. Apical thrill	Rare	Common
2. Collapsing pulse	Marked	Less marked
3. Apical systolic murmur	Seldom	Usually
4. Reduplication of second sound at apex	Seldom	More often
5. Accentuation of pulmonic second sound	Seldom	Usually
6. Presystolic accentuation of the diastolic murmur	Seldom	Frequently
7. Auricular enlargement by x-ray	Seldom	Frequently
8. Left axis deviation in electrocardiogram	Usually	Also signs suggestive of mitral disease
9. Dyspnea and palpitation	Less	More
10. Presence of lues	Almost always	Seldom
11. Rheumatic history	Less common	More often

It is realized that any or several of these criteria may be violated in a given instance, yet it seems that the differential diagnosis is sufficiently definite to justify the attempt to arrive at a decision concerning the presence of the Austin-Flint murmur in doubtful cases.

MENTAL HYGIENE AND PUBLIC HEALTH*

Mental hygiene is a large and important chapter in the book of preventive medicine. It is a newcomer and has not yet found its fixed place in public health procedures, but I prophesy that when we know more about it, mental hygiene will take an abiding place in organized health activities. Mental hygiene has breadth and depth. It is diffuse and rubs elbows with almost all human activities. It is especially a connecting link between public health and social welfare.

It has become a twice-told tale to recount the triumphs of preventive medicine, such as the control of typhoid fever, tuberculosis, diphtheria, yellow fever and many other infections. These are material gains that make life longer and surer; but longevity in itself is a poor index of the goal in view. There is little use in living longer unless we can live better. The real object of longevity should be to give greater opportunity for service in the world; in other words, we are not thinking so much in terms of material success as opportunity for spiritual progress. Hence, I think the next step is mental and moral hygiene.

If I understand mental hygiene correctly, it does not consist simply in preventing damage to the brain and in avoiding disorders of the mind, but concerns itself more particularly with the most difficult and complex problem of progress, namely, attaining and maintaining a sound mind. The ultimate object of health is a positive quality that must encompass the whole man, which includes his physical, mental and spiritual make-up. The ultimate in mental hygiene means mental poise, calm judgment and an understanding of leadership and fellowship—in other words, coöperation; with an attitude that tempers justice with mercy and humility. The sum-total of all these qualities is ordinarily called common sense, which is the quintessence of mental health. If some of this could be achieved, first in more individuals and then as a group psychology, it would not only increase individual happiness and the joy of life, but would give greater stability to our institutions and cure many of the present ills of society. With a community enjoying mental health, civilization would advance with a firmer step. It would contribute to the achievement of social justice. It would help soften depressions such as we are now in, and as a climax would furnish the good will and the good sense to avoid war and achieve peace.

A troubled world is one that is mentally sick. In order to prevent and cure these disorders in the individual as well as in society, we must know more about the mind and its workings. It is an axiom in preventive medicine that success with a disease depends upon our knowledge of that disease. In order to have a sound program for mental hygiene, we must know more about the structure and function of the mind, its relation to the body, and the causes of abnormal behavior. I therefore want to emphasize the appeal for encouragement and support of researches that will give us this firm footing, without which we are apt to flounder and allow the subject to be ruled by fads and fancies. I know of no field in which the harvest will yield greater benefits to mankind.

*Abstract of address delivered by Dr. M. J. Rosenau, Professor of Preventive Medicine and Hygiene, Harvard Medical School, at the 25th Anniversary Dinner of the National Committee for Mental Hygiene, Wednesday evening, November 14, at the Hotel Waldorf-Astoria, New York City.

VERMONT STATE MEDICAL SOCIETY

OBSERVATIONS ON CERTAIN PHASES OF THE HEALTH OF SIXTY-TWO NORMAL BOYS OVER A PERIOD OF A YEAR TOGETHER WITH A DESCRIPTION OF A METHOD OF ROUTINE PHYSICAL EXAMINATION*

BY J. H. BLODGETT, M.D.,† AND W. I. MAYO, JR., B.S.†

THE New England Kurn Hattin Homes of Westminster and Saxtons River, Vermont, admit children who are between the ages of seven and fourteen and who for various reasons have been deprived of a normal home. The trustees are required by the Articles of Association and by the terms of certain bequests to admit only children who are of normal mentality and who are in normal physical condition. They are not permitted to admit delinquents or to do correctional work.

To determine eligibility for admission it is, therefore, necessary to secure a complete family history for the purpose of determining financial and social need, a physical examination backed by some family information to determine the normality of physical condition, and a mental examination to determine in some degree whether the child is of normal mentality.

There has to be some interpretation of the word normal. This is more difficult in dealing with the mental condition than with the physical. As a definition and guide to determining normal mentality the trustees of the Homes have turned to the experience of the State of Massachusetts where the Department of Mental Diseases and the Department of Education have coöperated in setting up regulations for determining children retarded in mental development. These regulations include ten fields of inquiry: the physical examination, the family history, personal and developmental history, school progress, examination in school work, practical knowledge and general information, social history and reactions, economic efficiency, moral reactions, and mental examinations.

In determining eligibility for admission of children, the Homes are increasingly having the help of social workers throughout New England. In Vermont this is particularly true. The Vermont Children's Aid Society has for a consideration undertaken investigation where it could conveniently do so, and Kurn Hattin in turn for consideration has assisted in the training of children in their care. Sixty per cent of the children come from Vermont. Local physicians make the preliminary examinations and it is desired to express appreciation to the Medical Fraternity of Vermont and other New England states for this most valuable service.

The information needed for these determinations is collected on a Physical History Blank and a so-called Social History Blank. After the child arrives, a standard Binet test is given which supplements the information given on the other blanks. The Binet test alone is never allowed to be the determining factor in arriving at a decision concerning a child's mental development, but children as a rule are excluded who do not have an intelligence quotient of eighty or better. The policy of the trustees is that the Homes furnish a training program. This means that the children accepted must be able physically and mentally to profit by such a program. The Homes, however, attempt to correct minor physical defects which may occur after the children are accepted, such as adenoids and eye difficulties and, of course, dentistry. Each child is treated as an individual and records are kept of all activities. These include school work, hospitalization, clinic treatment, vocational training, and a personal record. A trial period of six months is given each child and during that period routine reports and studies are made by all workers with whom the child comes in contact. At the end of this period if it is felt that the expenditure of the necessary funds for a given child is not warranted, he or she is not retained.

Menus are carefully planned to give a balanced diet. Weights and heights are recorded each six months but are taken monthly. The school program is flexible allowing each child to progress as rapidly as he is able. Seventh and eighth grade work is supplemented by shop or farm work. The homes have facilities for teaching printing, agriculture, carpentry, sewing, and household economics at the present time. Other vocational work is planned for when funds permit. No time is set for discharge but it has been found possible to plan for most of the children adequately by the time they are ready to leave the eighth grade. Some few are allowed to stay longer if necessary. Each child is given a complete physical examination before leaving.

A very strict rule sends all cases or suspected cases of illness directly and immediately to the infirmary for observation by a registered nurse who is always in attendance. A record of all

*Read before the Vermont State Medical Society at its Annual Meeting at Barre, October 5, 1933.

†Blodgett, J. H.—Chairman, Executive Committee and Attending Physician, New England Kurn Hattin Homes. Mayo, Jr., W. I.—Director of New England Kurn Hattin Homes. For records and addresses of authors see "This Week's Issue," page 1032.

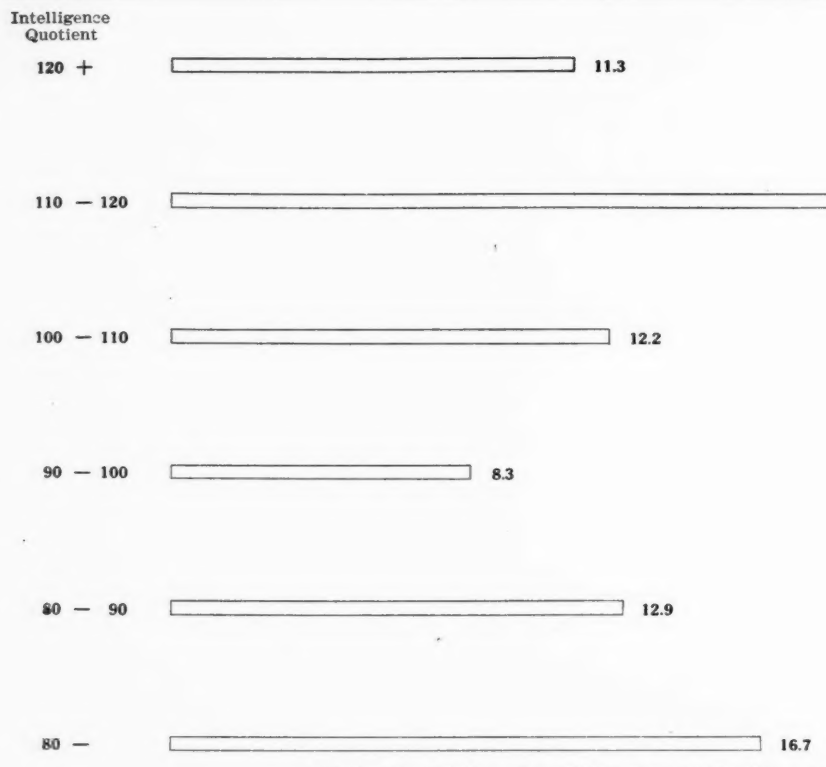


CHART I. Relation of mentality to hospitalization. Average number of days hospitalized per individual.

infirmary attention, no matter how unimportant or trivial, is kept on a special admission blank. The nurse hospitalizes any cases which require the attention of the attending physician and calls him. A record of the physician's diagnosis and treatment is kept on a special card which later is made a part of the child's permanent record. Dental treatment is given at the dentist's office where separate records are kept and later incorporated with the complete individual record and history.

The material offered below is the result of a

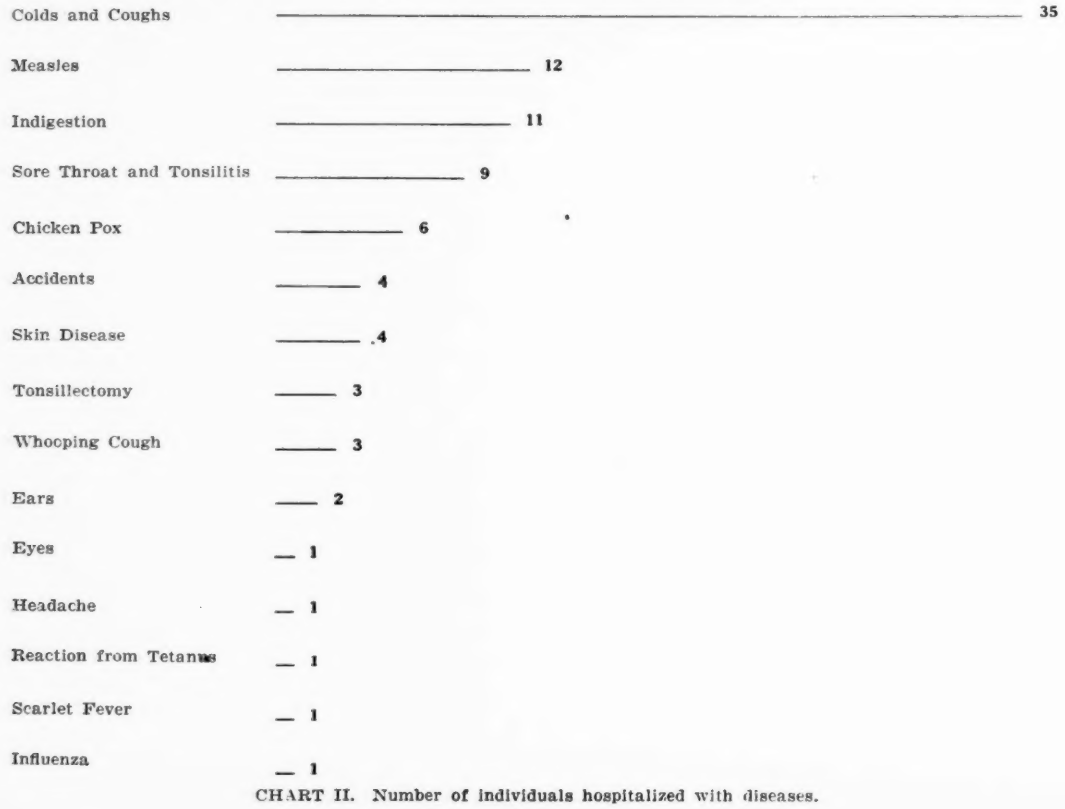


CHART II. Number of individuals hospitalized with diseases.

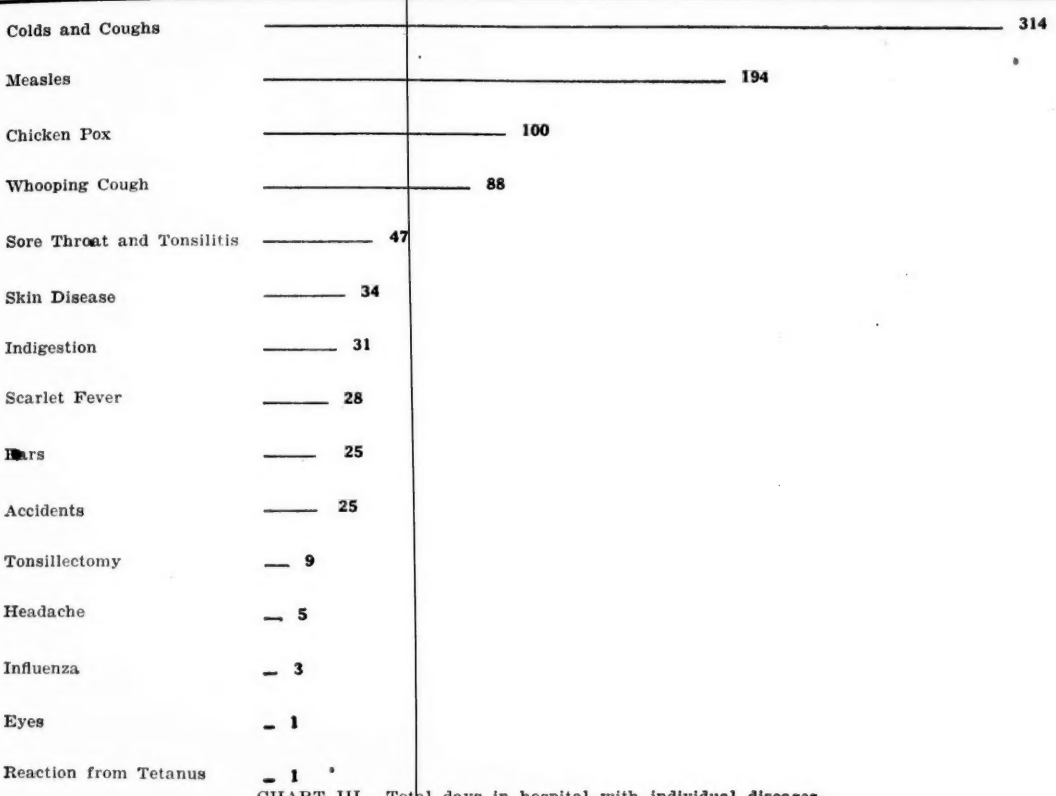


CHART III. Total days in hospital with individual diseases (individuals not considered).

computation and study of the medical records of sixty-two children who were residents of the Homes for one entire year. The Homes have an enrollment of ninety boys but many of them are accepted for a part of a year or are discharged before they complete a full year of residence. Sixty-two was the largest number on which complete records could be obtained over the full period. Several studies were made of the records. The main purpose was to ascer-

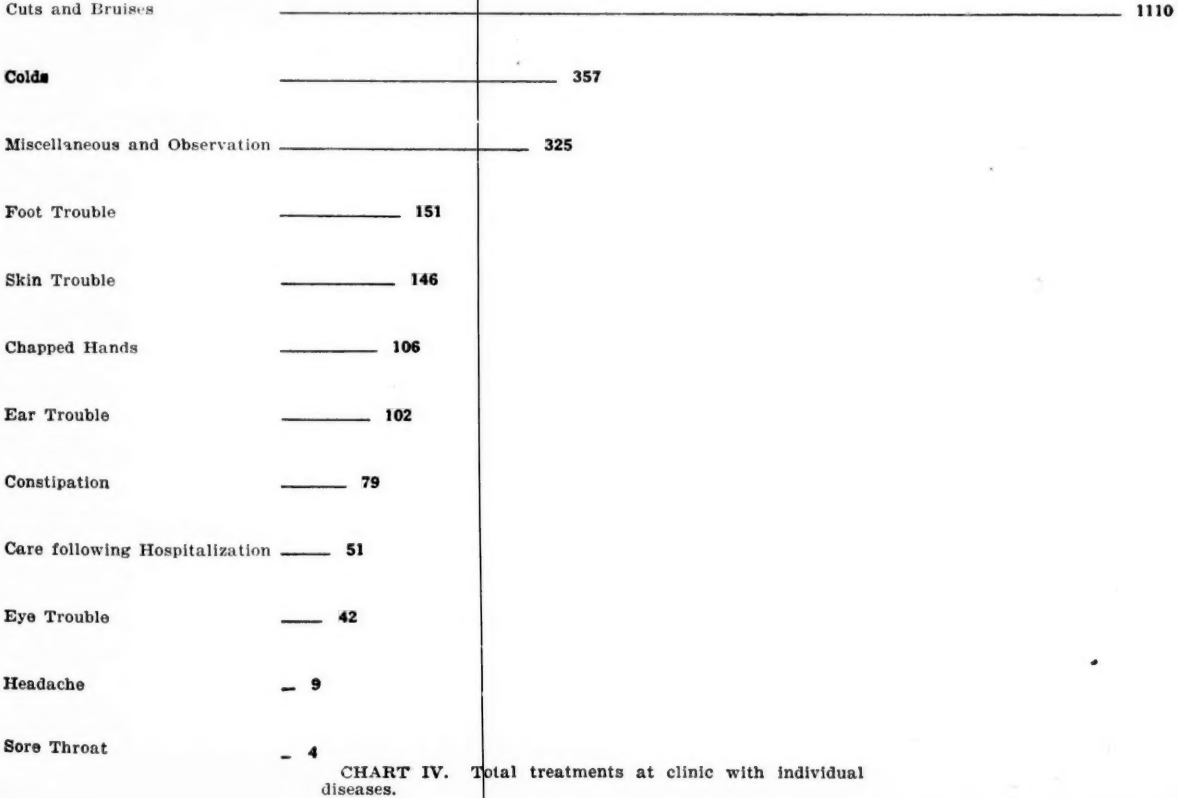


CHART IV. Total treatments at clinic with individual diseases.

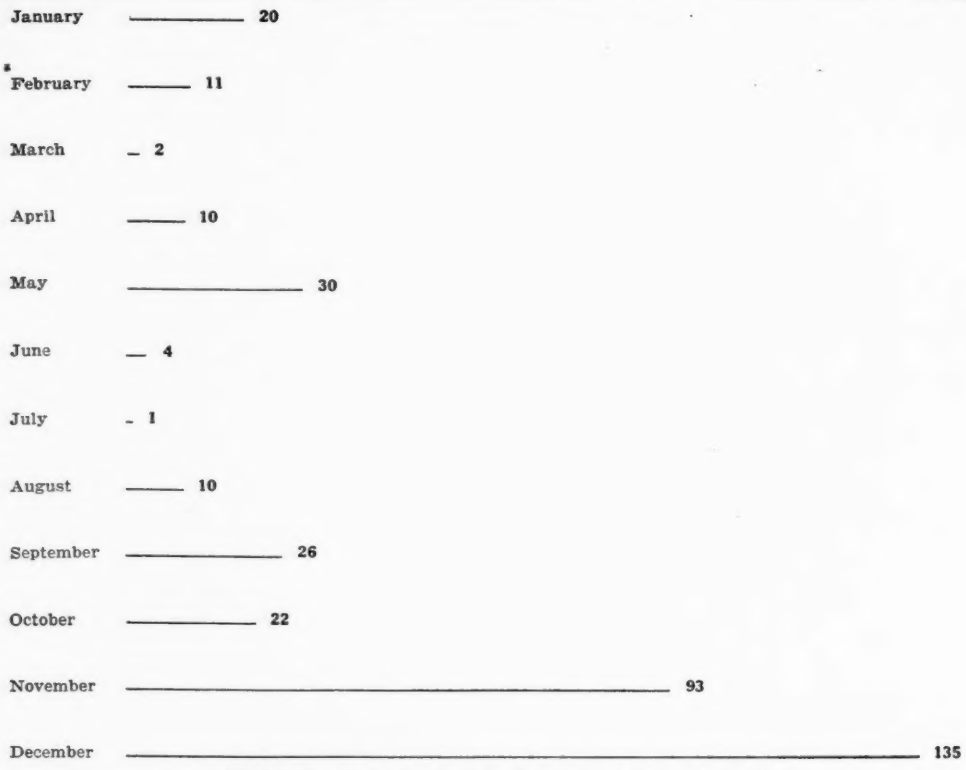


CHART V. Clinic treatments of colds and sore throats by months (individuals not considered).

tain which diseases were most prevalent and which times of the year one could expect the greatest amount of trouble.

The average age of the sixty-two boys considered was 12.43 years. The average weight at the beginning of the period considered in this paper was 86.98 pounds. The average weight at the end was 98.66 pounds. This gave an average gain of 11.68 pounds.

The first chart depicts a study which was

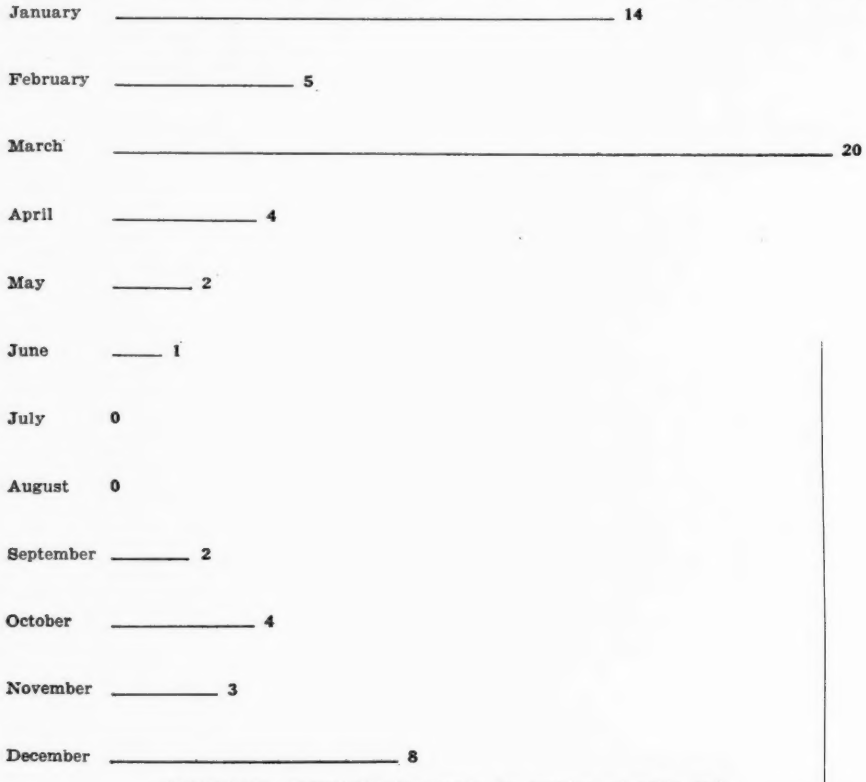


CHART VI. Hospitalization cases by months of colds and sore throats (individuals not considered).

made regarding the relation of mentality to hospitalization. The question is often raised as to the relationship of physical make-up to intelligence. Most of the studies along this line have dealt with the lower levels of intelligence. Merely as a matter of interest and not because it proves anything in particular, the chart below was compiled. With the number of boys considered there is some evidence which might lead one to feel that those of higher intelligence were more often ill. In any case further study with larger numbers would be interesting. This would be true of all the studies.

Chart two shows the complete hospitalization picture pertaining to the sixty-two individuals under consideration. The bars represent the number of individuals affected by the various diagnosed diseases. All of the diagnoses were made by a doctor. One individual may have had several diseases. Colds and coughs head the list, followed by measles. There was one case of scarlet fever and three of whooping cough.

Chart three shows the same picture as chart two except that the bars represent hospital days instead of numbers of cases. The order remains about the same except that the contagious diseases have required more time because of long quarantine periods.

Chart four shows the clinic treatments given the sixty-two boys over a yearly period. The bars represent number of treatments regardless of the individuals considered. Diagnoses were made by the nurse in most cases. Some of the clinic cases were later hospitalized so that there is some duplication with chart two.

In order to study the seasonal distribution of colds and sore throats charts five and six were prepared. It may be interesting to note that in the particular year under consideration (1932) *clinic* treatments of colds and sore throats were in larger number in December, while *hospitalization* cases were most prevalent in March. The lightest months for both hospital and clinic cases were June, July and August.

A description of the method of routine physical examination used at the Homes follows: Beginning at the top of the head the scalp is usually found negative. The frontal, ethmoidal, and maxillary sinuses are next examined. Serious involvement of these parts in children of the age under consideration is rare. Nasal polypi is almost never found.

As middle ear trouble has been very common among children admitted, careful attention is given this portion of the head and any signs of infection there are noted and carefully followed up. The attending physician has equipped himself to do special work in the field of eye, ear, nose and throat, as in the midst of epidemics these fields often become involved and daily work is required.

When a child is found to have 20/30 in each eye he is allowed to try regular work but the teacher is requested to watch him carefully. If the vision is under 20/30 the routine test as outlined at the Massachusetts Eye and Ear Infirmary, with refraction under Homatropin, is carried out. Necessary glasses are supplied.

Teeth are given early care. New admissions are sent to the dentist as fast as appointments can be made. Serrated edges of the teeth suggest struma possibly from lues or tuberculosis. There seems to be some difference of opinion among dentists as to what are considered Hutchinson teeth. It is the opinion of the writer that it is better to depend upon the particular shape in making this determination rather than on the nutritional condition.

A routine Wassermann is not done. Because of the small size of the vessels of the child and because he is sometimes frightened and disturbed by his new surroundings it has seemed inadvisable to cover this ground. An experience of thirty years has not given occasion to regret this seeming neglect. If there has been any suspicion of a possibility of lues it has always been possible to get the coöperation of Boston agencies in having laboratory investigation made there.

Tonsils and adenoids are studied carefully. In deciding whether to operate many factors are considered. The most important are cervical and other glands, mouth breathing, type of arch in the roof of the mouth, physical and mental activity, chest, size of joints, and symptoms of rheumatic pains. It is felt that too many tonsils are removed. Yet this year when ten children were examined who had had their tonsils removed and six were examined who had not, the ten were found to be in strikingly better physical condition than the six.

Tonsillectomies are performed at the Rockingham Hospital with after-care in the Kurn Hattin Infirmary. The operation as performed at the Children's Hospital in Boston is the technic used. The principal features of this operation are sitting position, continuous ether and suction, with dissection and snare. Each assistant is trained for his post and the operators and assistants are trained to work together. It is thought that free clinics, unfamiliar operation teams, and lack of adequate after-care, especially rest in bed, are a menace to children.

In completing the examination of the head it is thought well to bear in mind the possible connection between thyroid disease and an infected nose and throat. There may also be infection of the apices of the lungs from the same sources.

The chest like the middle ear is always a source of anxiety in epidemics, although at the Homes comparatively few cases of congestion in proportion to the total develop pneumonia. In

all colds it is the practice to prescribe routine cleansing of the nose and throat.

With definite pneumonia it has not been felt that the serums could be afforded but Lilly's Pneumococcus Antigens have been found of the greatest assistance. Pneumonia complicating whooping cough and Fisher's Rule as to prognosis in pneumonia were the subject of an interesting study recently. Dr. C. Lynnwood Chaffee, now of Jeffersonville, Vt., assisted and made observations which are here presented in chart form.

CHART VII

BLOOD PRESSURE IN NORMAL CHILDREN

	Blood Pressure	Pulse
Age 9	85/60	88 = −3
Age 10	95/60	88 = +7
Age 11	78/55	80 = −2
Age 12	95/60	72 = +23

CHART VIII

BLOOD PRESSURE IN WHOOPING COUGH UNCOMPLICATED

	Blood Pressure	Pulse
Age 12		
1st Day	85/55	84 = +1
2nd Day	85/55	100 = −15
3rd Day	85/55	86 = −1
4th Day	75/50	86 = −11
5th Day	70/60	80 = −10
Age 13		
1st Day	90/60	84 = +6
2nd Day	98/65	90 = +8
3rd Day	82/40	80 = +2
4th Day	88/55	84 = +4
5th Day	65/50	86 = −21

CHART IX

BLOOD PRESSURE IN WHOOPING COUGH COMPLICATED WITH BRONCHIAL PNEUMONIA

	Blood Pressure	Pulse
Age 10		
1st Day	100/70	84 = +16
2nd Day	80/50	86 = −6
3rd Day	95/70	100 = −5
4th Day	95/70	74 = +21
5th Day	95/55	80 = +15
6th Day	95/50	72 = +23
7th Day	94/60	72 = +22
8th Day	94/70	85 = +9
9th Day	80/50	80 = 0

These studies would seem to show that while the relation of blood pressure in adults to pulse rate is of real prognostic value in pneumonia, in children it is not of value unless the child's normal pressure can be determined.

A case of tuberculosis is rarely discovered. If one does appear it is sent to the Preventorium and Sanatorium immediately.

For convalescence from chest cases a kind friend has given funds for two sun porches, capable of housing ten patients. These porches are heated and can thus be used summer and winter. It is hoped that we may soon have glass which permits the transmission of the violet ray, if only for a small corner.

In diseases of the heart, while records of functional murmurs are not available in these studies, it is believed that about twenty-five per cent of the cases in measles, pneumonia, scarlet fever and influenza develop such murmurs.

These all call for rest in bed until the normal function of the heart is restored. The prophylaxis of serious heart disease and the prevention of the spread of contagious diseases add greatly to the number of days spent in the infirmary. It is believed that such hospitalization is one of the best services undertaken. The heart clinics of Philadelphia, New York, Boston, and the Mayos hold that much of the cardiac disease of later life is caused by lack of proper care of the heart during these acute infections. Preventive medicine is being attempted and in this connection toxin-antitoxin for prevention of diphtheria is given. The State Board of Health does not advise the Dick work in its present state of development. For several years immunization against pneumonia and the common cold has been done. This was successful for the first six years, then the treatment seemed to break down, and it was decided to omit it. A healthy body with all organs functioning is the aim at graduation time.

In examining abdomens, hernias or appendicitis cases are rarely found. Constipation and "intestinal grippe" infections are frequent. Constipation has been corrected with a glass of water after each meal. Cases of enuresis are not admitted. It is believed that this indicates a weakness of the central nervous system so much so as to amount to a defect.

The general appearance of the child is noted, particularly as it may relate to his mentality. The Massachusetts bulletin previously referred to states, "A bright-looking, alert, active, well-formed, attentive boy is rarely found to be mentally defective." We believe this to be true. This completes the work of examination. The data are recorded and placed on file. Immediately before discharge the child is given another medical examination in order that the management of the Homes may be sure that all correctable defects have been given attention.

MEDICAL PROGRESS

CARDIOVASCULAR REVIEW FOR 1933

BY PAUL D. WHITE, M.D.,* AND HOWARD B. SPRAGUE, M.D.*

THE review of medical literature published in 1933 reveals the maintenance of a high degree of interest and activity in cardiovascular investigation, including especially the introduction of a newly discovered method of treatment of heart failure and angina pectoris. This new method, the value of which in selected cases has been proved by the experience of 1934, consists of total removal of the normal thyroid gland; it is discussed under special treatment at the end of the review.

It is interesting that among methods of study, electrocardiography has claimed a preponderance of attention largely because of the development of our knowledge of the effect of coronary occlusion on the ventricular complexes and of the application of chest leads to this study.

The incidence of heart disease and especially of its types in different parts of the United States of America has begun deservedly to attract widespread interest. Among the etiologic types much has been written on coronary disease and the rheumatic heart as usual, and more than in many past years on congenital defects about which we are rapidly gaining new knowledge wherewith to clear some of the obscurities of former days.

Pathological conditions and disorders of function that have excited particular interest have been cardiac enlargement on the one hand, and congestive failure, angina pectoris, and heart block of various kinds on the other.

A total of 117 books and articles have been summarized for this review, following the convenient arrangement of the past which begins with "anatomy and physiology", continues with "methods of examination", "symptoms and signs", "incidence and types of heart disease" and "pathological findings", and ends with "disorders of function", "prognosis", and "special treatment". A few late references of 1932 have been included in the review.

GENERAL

Lewis has composed a small volume on diseases of the heart which should be very helpful to the practitioner and student who are beginning their study of heart disease. The book is concise and clear. There are, however, two essential points on which we disagree. In the first place Lewis states that the most important cardiovascular condition that comes to the attention of the practicing physician is heart failure. This shouldn't be so if it is. We believe that long before heart failure develops the physician should discover in most cases the presence of heart disease or strain, for by so doing he can often outline measures which may retard the onset of failure or even perhaps prevent it altogether. Secondly, following his

*White, Paul D.—Physician, Massachusetts General Hospital. Sprague, Howard B.—Assistant Physician, Massachusetts General Hospital. For records and addresses of authors see "This Week's Issue," page 1032.

teacher, Mackenzie, and the English school Lewis emphasizes signs and symptoms of right heart failure as most important, in contrast to the greater significance of the common and often neglected clinical concept of left ventricular failure.

Dieuaide has contributed a good review of the development of our knowledge of valvular disease.

Dieuaide, F. R.: Development of our knowledge of valvular disease of the heart. Chinese M. J., 47:785, 1933.
Lewis, T.: Diseases of the Heart Described for Practitioners and Students. New York: The Macmillan Company, 1933.

ANATOMY AND PHYSIOLOGY

Bohning, Jochim, and *Katz* have found that bismuth was conveyed from the heart chambers into the coronary sinus blood in the beating heart in seven out of ten experiments with the coronary circulation isolated from the systemic. In two of these experiments, the possibility of any connection between the systemic and the coronary blood by means of extra cardiac anastomoses from the aorta was excluded by perfusing directly into the coronary arteries which were dissected and ligated proximal to the cannulae. In preparations of beating hearts with a completely isolated coronary circulation, a suspension of a pure culture of killed bacteria was injected into the superior vena cava. The same bacteria could be demonstrated in the sinusoidal spaces, the capillaries, the small intramural arteries and veins, the superficial branches of the coronary arteries and veins, and also in the blood from the coronary sinus. These experiments, therefore, indicate that the thebesian vessels do form a pathway in the functioning heart by which blood can be conveyed from the heart chambers to the intramural coronary vessels.

Under normal conditions, the amount of blood conveyed by this pathway appears to be comparatively small but in some pathological conditions, where the coronary arteries are occluded, enough blood may find its way into the coronary capillaries to aid appreciably in the nourishment of the heart.

By the employment of injection methods, *Wearn* and his associates have found it possible to demonstrate vascular communications between the coronary arteries and the chambers of the heart. Serial sections and wax-plate reconstructions of these communicating vessels revealed two types which have not been described previously. The first of these communicating vessels are small branches of arteries or arterioles lying near the endocardium. They run a short course and empty directly into the lumen of the heart and, for this reason, they have been referred to as "arterio-luminal" vessels. The second type of vessel arises as a branch of an artery or arteriole and soon breaks up into sinusoids which lie between the muscle bundles and at times between the individual muscle fibers. These vessels have been referred to as "arterio-sinusoidal" vessels, and the sinusoids have been designated as "myocardial sinusoids".

The histological structure of the "myocardial sinusoids" would indicate that they play a rôle in the nourishment of the heart muscle.

Weiss and *Baker* have presented a study of the effect of the mechanical stimulation of the carotid sinus in health and in cardiovascular disease. Whereas in normal individuals carotid sinus stimulation produced slight or no fall in systemic blood pressure, in patients with hypertension and in patients with primary arteriosclerosis but without hypertension the fall in pressure occurred more frequently and to a greater degree. The evidence available does not support the contention that local pathologic disease of the carotid sinus plays an important rôle in the causation of arterial hypertension.

Studies were conducted on fifteen patients in whom the carotid sinus reflex was hyperactive. Thirteen of these patients complained of spontaneous dizziness and fainting attacks, and pressure on one or each of the sinuses induced dizziness and fainting, together with convulsive seizures.

Three main types of cardiovascular response were observed following stimulation of the sinus: (a) marked asystole or sudden slowing of heart rate with or without marked fall in arterial blood pressure, (b) marked fall in arterial blood pressure without essential cardiac slowing, and (c) changes in the cerebral circulation without essential slowing of the heart rate and without fall in arterial blood pressure.

A hyperactive carotid sinus can induce striking changes in the intracardiac conductive system.

Epinephrin abolishes the cardiovascular responses and the symptoms of the hyperactive reflex. Paralysis of the parasympathetic nerve endings with atropine abolishes the cardiac but not the peripheral vascular changes.

White, Garrey, and *Atkins* have shown that, in the dog, cardiac pain is not transmitted by the vagus nerves, that it is not prevented when afferent impulses from the areas to which cardiac pain is usually referred are blocked by sectioning the upper intercostal nerves on both sides, and that bilateral resection of both stellate ganglions may diminish, but does not block, all sensory stimuli from the heart. "Bilateral removal of the sympathetic ganglions from the stellate down through the fourth thoracic ganglion or section of the upper five posterior dorsal nerve roots appears to interrupt all sensation from the heart." . . . "The motor pathways to the heart cannot be completely destroyed by bilateral excision of the stellate ganglions. The upper thoracic ganglions below the stellate ganglion send important motor, as well as sensory,

fibers directly across the posterior mediastinum to the posterior cardiac plexus." The authors "believe that these experiments explain the frequent failures and poor results of the many different modifications of cervical sympathectomy which have been recommended for the relief of angina pectoris".

Bohning, A.; Jochim, K., and Katz, L. N.: The Thebesian vessels as a source of nourishment for the myocardium. Am. J. Physiol., 106:183, 1933.
Wearn, J. T.; Mettier, S. R.; Klumpp, T. G., and Zschiesche, L. J.: The nature of the vascular communications between the coronary arteries and the chambers of the heart. Am. Heart J., 9:143, 1933.
Weiss, S., and Baker, J. P.: Carotid sinus reflex in health and disease; its rôle in causation of fainting and convulsions. Medicine, 12:297, 1933.
White, J. C.; Garrey, W. E., and Atkins, J. A.: Cardiac innervation; experimental and clinical studies. Arch. Surg., 26:765, 1933.

METHODS OF CARDIOVASCULAR EXAMINATION

Auscultation. *Blumgart* and *Ernstene* have shown that Duroziez's sign occurs in two entirely different conditions and that the two mechanisms producing the sign are opposite in nature and can be differentiated with ease at the bedside by certain simple clinical tests. "In patients with preponderant peripheral vasodilatation (thyrotoxicosis, anemia, fever, normal subjects with increased local blood flow due to immersion of the limb in hot water), the diastolic arterial murmur is due to an increased forward flow of blood toward the periphery during diastole. In patients with aortic regurgitation, the diastolic arterial murmur elicited by pressure on the artery with the stethoscope is similar to that heard in other conditions, but it is due not to a forward flow of blood but to a backward flow of blood during diastole toward the heart. In patients with aortic regurgitation the diastolic murmur may be strikingly accentuated by pressing predominantly with the lower edge of the stethoscope bell (Peabody type), by immersing the arm in cold water, or by applying a cuff inflated to subdiastolic pressure to the limb below the site of auscultation. In patients with preponderant peripheral vasodilatation the diastolic murmur is increased by pressure with the upper edge of the stethoscope, while the murmur is abolished by immersion of the limb in cold water or by application of subdiastolic pressure distal to the site of auscultation. Duroziez's sign as classically elicited simply denotes, therefore, an increased flow of blood in the artery beneath the stethoscope during diastole but does not indicate whether blood flow occurs in a forward direction toward the periphery because of preponderant vasodilatation or backward toward the heart because of aortic reflux. The tests we have outlined enable one to decide these questions and are of value in differentiating aortic insufficiency from other conditions."

Wolferth, Wood and *Margolies* have reported hearing in two cases of cardiac infarction an auriculosystolic murmur over the "tricuspid area" during convalescence. The data suggested to the authors that the sound was produced in some way by the flow of blood from the right auricle to the right ventricle.

Wolferth and *Margolies* have written that "(1) the only available criterion for distinguishing between the third heart sounds and gallop rhythm is the status of cardiac function. Both types of sound are accentuated by the same procedures. They have similar time relations, quality and intensity. Their positions of maximum audibility are identical except that right-sided physiological third heart sounds are unknown; (2) gallop and physiological third heart sounds invariably fall in either the protodiastolic or the auriculosystolic zone; (3) when these two time zones become superimposed either as a result of tachycardia, minor grade heart block, sinus arrhythmia or auricular extrasystoles, gallop sounds may either appear for the first time, or, if already present, become markedly accentuated. This effect is so pronounced as to constitute a summation phenomenon. (4) The hypothesis of summation is in accord with all known facts regarding gallop rhythm. Moreover, it offers a reasonable explanation for some of the variations in gallop sounds hitherto unaccounted for. (5) A classification of physiological third heart sounds and gallop rhythm, based on Potain's classification of gallop rhythm, but altered to correspond with objective phenomena, is proposed. The erroneous concept of mesodiastolic gallop is discarded, and summation gallop is recognized. The classification abolishes the practical difficulties, heretofore encountered so frequently, in placing cases into proper categories. (6) There appears to be no great disparity in the incidence of presystolic or protodiastolic gallop. Summation gallop is little if any less frequent. It can be produced in cases with either of the other types of gallop, or in cases with a predisposition to gallop, by the simple expedient of accelerating the cardiac rate enough to bring about superimposition of protodiastolic and presystolic events. (7) Potain's conception of right-sided gallop rhythm, disputed by certain observers, has been confirmed by our investigations. It tends to occur in cases exhibiting predominantly right-sided heart failure. (8) In the differential diagnosis of gallop rhythm and the physiological third heart sound, errors have been encountered involving one or another of the following: (1) the opening snap of mitral stenosis, (2) mid-diastolic murmur, (3) presystolic murmur, (4) reduplicated first heart sound, (5) reduplicated second heart sound. Other possible sources of error are (a) pericardial friction sound, (b) mid-systolic click, and (c) the so-called systolic gallop rhythm. In the great majority of cases differentiation is possible by clinical methods alone. In occasional cases, however, accurate timing requiring graphic methods is necessary."

Blumgart, H. L., and Ernstene, A. C.: Two mechanisms in the production of Duroziez's sign; their diagnostic significance and a clinical test for differentiating between them. J. A. M. A., 100:173, 1933.
Wolferth, C. C., and Margolies, A.: Gallop rhythm and the physiological third heart sound. I. Characteristics of the sounds, classification, comparative incidence of the various types and differential diagnosis. Am. Heart J., 8:441, 1933.
Wolferth, C. C.; Wood, F. C., and Margolies, A.: An auriculosystolic murmur in "tricuspid area" during convalescence from acute coronary occlusion. Am. J. M. Sc., 186:496, 1933.

Blood Flow Studies. *Starr, Collins,* and *Wood* have assembled duplicate determinations of cardiac output and metabolism, repeated estimations of blood pressure and pulse rate, and orthodiagrams in fifty individuals fasting and lying at rest. Those tested included normal persons, patients recovered from congestive failure, and patients with some circulatory abnormality but not immediately threatened with failure, that is, thyrotoxicosis, hypertension, anemia, angina pectoris, and compensated valvular disease. The results show that "within physiological limits the larger the size of the heart, the greater is the energy of its contraction", and that "when the work of any heart is not commensurate with its size, that heart is threatened with failure".

Gargill has studied the use of decholin injection as a clinical test of the velocity of blood flow and has described a technic which differs in certain respects from the original technic used by Winternitz and his associates. In fifty normal individuals the average "arm to tongue circulation time" was fifteen seconds. This compares favorably with the average arm to arm circulation time found in fifty-three normal individuals by Blumgart, using the radioactive method.

Gargill, S. L.: The use of sodium dehydrocholate as a clinical test of the velocity of blood flow. New Eng. J. Med., 209: 1089, 1933.
Starr, I., Jr.; Collins, L. H., Jr., and Wood, F. C.: Studies of the basal work and output of the heart in clinical conditions. J. Clin. Investigation. 12:13, 1933.

Blood Pressure Estimation. *Korns* and *Guinand* have analyzed the data obtained by bilateral brachial blood pressure measurements in 1000 normal persons. There was a significant inequality in the pressure in 378 persons; nearly three-quarters of the higher pressures were dextrolateral. "Sphygmic inequality without organic disease is probably always transitory, and it is reasonably certain that all normal persons manifest it at one time or another. The inequality may involve only the systolic pressures, or only the diastolic, or both." The mechanism of this inequality is unknown but "sphygmic inequality in the brachial or carotid arteries cannot be regarded as a sign of disease of the aorta or its branches unless it can be shown to be permanent".

Brams, Katz, and *Schutz* have described a new method of estimation of the pressure in a vein of the hand by means of transillumination.

Brams, W. A.; Katz, L. N., and Schutz, W. J.: Intravenous pressure. (I) New method of determination. Arch. Int. Med., 51:33, 1933.
Korns, H. M., and Guinand, P. H.: Inequality of blood pressure in the brachial arteries, with especial reference to disease of the arch of the aorta. J. Clin. Investigation, 12:143, 1933.

Graphic Methods

Cardiography. *Abramson* has reported a study of the backstroke, recoil, or kick given to the body by the heart beat. For this purpose he constructed a special apparatus, a recording chair, which he called a cardiodynamograph. Tracings taken with this instrument showed increase of the dynamic force of the heart beat after exercise, after adrenalin, and in cases with aortic regurgitation and with aortic aneurysms.

Dressler has published an extensive treatise on the movements of the chest in heart disease. Pulsation curves are shown taken from various points on the thorax with all kinds of cardiac and great vessel abnormalities.

Abramson, E.: Die Rückstosskurve des Herzens (Kardiodynamogramm). Skandinav. Arch. f. Physiol., 66:191, 1933.
Dressler, W.: Die Brustwandpulsationen als Symptome von Herz- und Gefässkrankheiten. Wien: W. Maudrich, 1933.

Electrocardiography. *Campbell* and *Allison* have discussed the electrocardiographic changes in toxic polyneuritis. Three cases were reported, aged twenty-three, nineteen, and forty-three years respectively. The T waves in Leads 1 or 2 were inverted, with recovery later.

Carr, Hamilton, and *Palmer* found a large Q_3 wave, as defined by Pardee, in seventeen of 342 pregnant women. This is slightly less than 5 per cent. Ninety-eight of the total series had organic heart disease or signs which justified a diagnosis of possible organic heart disease. Only three of these cases had large Q_3 waves, slightly more than 3 per cent. Two hundred and forty-four of the women had no organic heart disease. Fourteen of these had large Q_3 waves (5.7 per cent).

The anginal syndrome was not present in any of this series, nor had the authors ever found it in a pregnant woman.

A large Q_3 wave may occur transiently, apparently modified by phases of respiration. The authors found nine such cases in this series.

A large Q_3 wave was frequently associated in this series with inverted T waves and low or inverted P_3 waves. These findings are characteristic of transverse position of the heart according to evidence from the literature.

The authors conclude that the comparatively frequent occurrence of large Q_3 waves during pregnancy in patients with normal hearts, as contrasted with its reported rare occurrence in series of patients with normal hearts where pregnancy was not mentioned and probably was rarely present, suggests that a large Q_3 wave may be related to a transverse position of the heart such as occurs during pregnancy. In the

authors' opinion, therefore, a large Q_3 wave is not reliable as a sign of heart disease.

Evans and *Hoyle* have studied the effects of nitrites in twenty-three patients with inverted T waves in the electrocardiogram. In eleven cases the T waves were made upright. The authors believe that elevation of the inverted T wave by nitrite in patients with angina pectoris is determined by the relief of myocardial ischemia and that further observations may show that the fixed T wave and the one elevated by nitrite bear a different significance; the test may be a "measure of the efficiency of the collateral circulation around a damaged portion of heart muscle."

Faulkner and *Hamilton* have taken electrocardiographic records of fifteen patients suffering from diabetic coma. High skin resistance, which was uniformly present, offered a serious obstacle to precise analysis of the individual complexes. In nine cases the electrocardiogram was within normal limits, while in four others the abnormal feature (diphasic T_1 or T_2 or both) might be explained by "overshooting" due to the high skin resistance. In two cases the abnormalities could not be explained entirely on this basis. One showed a slightly low origin of the T wave in Lead 1 with a low amplitude of the T wave in Lead 2. The other showed a flat T wave in Lead 1 and low amplitude of the T wave in Lead 2.

"The conclusion to be drawn from these cases is that electrocardiographic changes are not the rule in diabetic coma and when present they consist of minor T wave abnormalities which are not likely to be confused with or to mask the picture of coronary occlusion."

In studying the significance of the deep Q wave, *Freundlich* found that the enlargement of the Q wave always concurs with a change in the intermediate portion (RS up to T) or in the T wave in at least one of the three leads. The isolated appearance of the enlarged Q wave in the third lead is not necessarily pathologic, since it is observed occasionally in patients who have a high diaphragm but who are free from other cardiac changes. However, if an enlarged Q_3 wave concurs with an enlarged Q_2 wave or with an enlargement of the T wave or of the intermediate portion in Leads 1 and 2, it is a symptom of myocardial infarct or of severe myocardial damage and usually indicates a coronary sclerosis (or stenosis of the coronary ostium resulting from syphilis). The appearance of a deep Q wave in the first lead has the same significance, even if there is no other change in the ventricular complex in the first and second leads. In disturbances that are not the result of a coronary sclerosis (in rheumatic endocarditis and myocarditis and in thyrotoxicosis) an enlargement of the Q wave is extremely rare. The most frequent change in the ventricular complex during myocardial damage is an enlargement of the Q wave in the 2nd and 3rd leads (Q_3 larger than Q_2) combined with negativity of the T wave or with depression of the intermediate portion in the same leads.

Hanson, Purks, and *Anderson* have reported their electrocardiographic study of twenty-five cases of dying human heart (which makes a total of 95 to date in the literature). In four of five cases epinephrine into the heart caused a return of the complexes. The ages of their cases ranged from fourteen to fifty-five. Auriculoventricular heart block was present in seven, sinoauricular block in two, premature beats in ten (auricular in one, ventricular in five, and nodal in four), ventricular fibrillation in ten (with temporary recovery in two), nodal rhythm in sixteen, periods of auricular or ventricular asystole in ten, ventricular tachycardia in four, and intraventricular block in five. The period of time from clinical death to final complex averaged five minutes; the longest time was thirty-five minutes.

Kissin, Ackerman, and *Katz* have studied the effect of the heart's position on the electrocardiographic appearance of bundle branch block. In two cases of left bundle branch block change from the supine or sitting position to lying on the left side changed the QRS wave of Lead 3 from inverted to upright.

Siegel and *Young* have reported their electrocardiographic findings in a patient with tumor of the heart, and have discussed the frequency of cardiac tumors and their location in the heart. The similarity of the electrocardiographic findings in a case of tumor of the heart and in myocardial changes from other causes is pointed out, especially the similarity of records in cases of coronary disease. The distinctions between records of coronary disease and those of tumor are noted, especially the lack of reciprocal direction of T waves in Leads 1 and 3 and the failure to show deviation from the iso-electric level in the S-T segments. The changes seen in electrocardiograms in tumor cases give some evidence as to the location of the neoplasm in the heart.

Wilson, Macleod, and *Barker* have described the distribution of the currents of action and of injury displayed by heart muscle and other excitable tissues. They report that "the electric currents produced by the heart beat are distributed within the body in accordance with the laws that govern the flow of electricity in volume conductors. When one electrode of the string galvanometer is placed in contact with the heart and the other upon one of the extremities, the resulting curve may be considered a record of the potential variations of the cardiac electrode alone; the second electrode is so far from the heart in comparison with the first that its potential may be regarded as zero throughout the cardiac cycle without material error. The curves obtained from certain auricular regions

by this method of leading are, with respect to their general outline, of relatively simple form. The shape of these curves indicates that the electrical phenomena associated with the spread of the excitatory process are similar to those that would occur if the crest of the wave of excitation were immediately preceded by a positive pole, or source, and immediately followed by a negative pole, or sink.

"When one electrode is placed upon an injured region of the cardiac surface and the other is distant from the heart, a curve of the so-called monophasic type is obtained. The form of this curve indicates that the injured region becomes relatively positive during systole or rather that it loses during systole the relative negativity that it displays during diastole. . . . The electric field produced by an injured muscle fiber is approximately equivalent to that which would be produced by polarization of the surface which separates the injured from the uninjured tissue."

Zeisler and *Katz* have reported studies of the electrical field of the heart with especial reference to invariants of the electrocardiogram. They have reported that every electrocardiogram depends on the electrical changes in the heart muscle and on extracardiac factors, some of which are independent of, and others dependent on, the particular lead employed. By using many different leads (about 150) on one individual the invariance of various properties of the electrocardiogram were investigated to determine which properties were invariants, i.e., independent of the particular lead used. The only known independent invariants are its time relations, namely the sequence of cycles, their rhythms, the division of each cycle into three complexes, the duration of P, of QRS, of QRST, of T, and of the P-R (P-Q) and S-T intervals. All other properties studied, such as direction, amplitude, contour, notching, slurring, the algebraic sum of the initial and final ventricular deflections, and the Einthoven quantity were found to be non-invariants.

Campbell, S. B. B., and Allison, R. S.: Electrocardiographic changes in toxic polyneuritis. Lancet, 2:410, 1933.
Carr, F. B.; Hamilton, B. E., and Palmer, R. S.: The significance of large Q in lead III of the electrocardiogram during pregnancy. Am. Heart J., 8:519, 1933.
Evans, W., and Hoyle, C.: The effects of nitrite on the inverted T wave in the human electrocardiogram. Lancet, 1:1109, 1933.
Faulkner, J. M., and Hamilton, B. E.: The electrocardiogram in diabetic coma. Am. Heart J., 8:691, 1933.
Freundlich, J.: Die klinische Bedeutung der Q-Zacke im Elektrokardiogramm. Deutsches Arch. f. klin. Med., 175:129, 1933.
Hanson, J. F.; Purks, W. K., and Anderson, R. G.: Electrocardiographic studies of the dying human heart, with observations on the intracardiac injection of epinephrine; report of twenty-five cases. Arch. Int. Med., 51:965, 1933.
Kissin, M.; Ackerman, W., and Katz, L. N.: Effect of heart's position on electrocardiographic appearance of bundle-branch block in man. Am. J. M. Sc., 186:721, 1933.
Siegel, M. L., and Young, A. M.: Electrocardiographic findings in tumors of the heart, with a report of a case. Am. Heart J., 8:682, 1933.
Wilson, F. N.; Macleod, A. G., and Barker, P. S.: The Distribution of the Currents of Action and of Injury Displayed by Heart Muscle and Other Excitable Tissues. Univ. of Michigan Press, Ann Arbor, 1933.
Zeisler, E. B., and Katz, L. N.: Studies of the electrical field of the heart. (I) Invariants of the electrocardiogram. Am. Heart J., 8:676, 1933.

Roentgenology. Meldolesi and *Meldolesi* have written a good review of clinical roentgenologic study of pulmonary vascular patterns in normal and pathologic conditions. They have discussed azygos vein distention as well as distention of the pulmonary vessels.

Parade and *Kuhlmann* have discussed the roentgenologic aspects of coronary sclerosis. They consider the position of the chest very important in obtaining records of calcified vessels and believe that the descending branch of the left coronary artery in front is the one most likely to give a shadow in profile at the left border of the heart shadow if the thorax is rotated slightly to the left with the Roentgen tube behind the patient.

Parade, G. W., and Kuhlmann, F.: Coronarsklerose im Röntgenbild. Klin. Wchnschr., 12:1247, 1933.
Meldolesi, Gastone, and Meldolesi, Gino: Studio clinico-radiologico del disegno polmonare (vascolare) in condizioni normali e patologiche. Policlinico, 40:738, 1933.

SIGNS AND SYMPTOMS

Clubbing of the fingers. Ragins and *Freilich* have reported an apparent case of familial congenital clubbing of the fingers and toes in a man thirty-four years old. His heart and lungs showed no abnormalities. The patient stated that his father, paternal uncle, and sister had identical clubbing of their fingers and toes.

Ragins, O. B., and Freilich, E. B.: Familial congenital clubbing of the fingers and toes. Report of a case. Ann. Int. Med., 6:946, 1933.

Edema. Weech and his associates have studied the relationship of edema in dogs to reduction of protein in the blood and have found no margin of safety. Gradual fluid retention seems to accompany the entire process of plasma protein depletion. "When edema is looked upon as a degree of interstitial fluid accumulation great enough to permit detection by finger palpation, a fairly close correlation is found between this symptom and plasma albumin only. With concentrations less than 1 gram per 100 c.c. edema is always present; with concentrations above 2 grams per 100 c.c. it is nearly always absent. . . . Plasma specific gravity follows closely the fluctuations in total plasma protein and does not exhibit a correlation with edema."

Weech, A. A.; Snelling, C. E., and Goettsch, E.: The relation between plasma protein content, plasma specific gravity and edema in dogs maintained on a protein inadequate diet and in dogs rendered edematous by plasmapheresis. J. Clin. Investigation, 12:193, 1933.

Other Signs. Morrison has reported an investigation of the dorsalis pedis and posterior tibial pulses in 1000 persons without symptoms of circulatory affections of the extremities. Unexpectedly there were 191 persons in whom from one to four of the pulses were absent. All four pulses including the two in each foot were absent in nineteen individuals. Absence of the posterior tibial pulse was more common than absence of the dorsalis pedis pulse, 128 to 89.

There was no relationship of these findings to age or arteriosclerosis. The variations of the pulses are due to anatomic anomalies of the arteries. In thirty-one cadavers examined there were deviations from the usual normal in seven, all in the dorsalis pedis artery.

Morrison, H.: A study of the dorsalis pedis and posterior tibial pulses in one thousand individuals without symptoms of circulatory affections of the extremities. New Eng. J. Med., 208:438, 1933.

THE INCIDENCE OF HEART DISEASE

In January, 1931, the *New York State Department of Health* commenced a survey of morbidity from heart disease in the state, exclusive of New York City. During the first half of the year 296 physicians reported 1,934 cases: 933 males and 1,001 females. The age distribution of the patients was as follows: under forty years, 27.4 per cent; between forty and sixty years 30.5 per cent; sixty years and over, 42.1 per cent. The average age was 51.5 years, and the median age, 55.7 years.

The males were, as a group, younger than the females. Of the former, 24.7 per cent were under forty years; of the latter, 29.9 per cent; the average age of the males was 52.9 years, the median age, 57.7, while the average age of the females was 50.3 years, and the median age 53.5.

The leading etiological factors were: rheumatic infection, 27.2 per cent; hypertension, 20.1 per cent; coronary disease, 8.8 per cent; syphilis 4.6 per cent; congenital 2.4 per cent; other acute infections 14.5 per cent; thyrotoxicosis 3.6 per cent; other factors 7.2 per cent; and in 11.6 per cent the etiology was unknown. The proportion of syphilitic heart disease among males was three times that among females.

Pathology: damage to valves was indicated in 48.7 per cent; damage to myocardium, 28.9 per cent; damage to coronary vessels, 19.8 per cent. Coronary disease was more prevalent among males, while valvular disease and "damage to myocardium" was more prevalent among females. The proportions were: coronary disease males 23.7 per cent, females 16.0 per cent; valvular disease, males 45.0 per cent, females 52.1 per cent; "damage to myocardium", males 27.8 per cent, females 30.0 per cent.

Gager and *Dunn* have studied the etiologic types and factors of race, age, and sex in 1200 cases of heart disease in Washington, D. C. Their findings are as follows:

White Race

Probable Causes	Male	Female	Total	Per Cent
Rheumatism	18	25	43	7.2
Syphilis	22	4	26	4.3
Hypertension	138	170	308	51.4
Coronary arteriosclerosis	102	54	156	26.0
Hyperthyroidism	1	21	22	3.7
Bacterial endocarditis	4	7	11	1.8
Other	17	17	34	5.6
Total	302	298	600	100.0

Colored Race

Probable Causes	Male	Female	Total	Per Cent
Rheumatism	12	16	28	4.7
Syphilis	60	33	93	15.5
Hypertension	147	208	355	59.2
Coronary arteriosclerosis	52	28	80	13.3
Hyperthyroidism	0	7	7	1.2
Bacterial endocarditis	4	2	6	1.0
Other	11	20	31	5.1
Total	286	314	600	100.0

Laws has studied 645 cases of organic heart disease in Tennessee with reference to etiology, racial distribution, sex, and age. Organic heart disease occurred in 4.9 per cent of all Negroes coming to Vanderbilt University Hospital and Out-Patient Department in 1930 and 1931, and in 3.3 per cent of the whites. The incidence in the Negro race was therefore 1.5 times greater than in the white race. Arteriosclerotic hypertensive heart disease accounted for 65.1 per cent of the cases in the white race, and 71.8 per cent in the Negro race. Rheumatic heart disease formed 15.3 per cent of the cases in the whites and only 4.3 per cent in the Negroes, while syphilitic heart disease was seven times more common in the Negro than in the white, 15.4 per cent and 2.2 per cent respectively. Comparative statistics from various sources show that the etiology of heart disease varies somewhat in different sections of the United States. Therefore, the problems of the prevention of heart disease are not identical in all parts of the United States.

Rathe and *Paul* have analyzed 1329 cases of organic heart disease admitted to the University Hospital of Iowa City, Iowa, during the five-year period from 1926 to 1931. "Arteriosclerosis was the most common etiologic factor and was responsible for the cardiac disability in 664 cases or 49.9 per cent. This was by far the most common disability after the age of forty." Hypertension is included in this arteriosclerotic group by the authors (it occurred in 459 [or 69 per cent] of these 644 arteriosclerotics). "A diagnosis of rheumatic heart disease was made in 363 cases (27.3 per cent). This constituted the major cause for the cardiac disability below the age of forty. Thyrotoxicosis was a factor in the cardiac disease in 116 cases (8.72 per cent). In six the cardiac disability was associated with hypothyroidism. . . . In 83 cases (6.24 per cent) the diagnosis of syphilitic heart disease was made. In this group a positive blood Wassermann was obtained in 85 per cent of the cases. . . . The congenital group consisted of thirty-five cases (2.63 per cent)." Subacute bacterial endocarditis was present in 1.6 per cent; the classification was unknown in 2.03 per cent. Angina pectoris (35 cases) and coronary occlusion (35 cases) were included in the arteriosclerotic group.

DePorte, J. V.: Heart disease in general medical practice, preliminary report of morbidity survey conducted by the New York State Department of Health. Am. Heart J., 8:476, 1933.
Gager, L. T., and Dunn, W. L.: Heart disease in Washington, D. C.; study of etiologic types and factors of race, age, and sex in one thousand two hundred cases. M. Ann. District of Columbia, Washington, 2:112, 1933.
Laws, C. L.: The etiology of heart disease in whites and negroes in Tennessee. Am. Heart J., 8:608, 1933.
Rathe, H. W., and Paul, W. D.: Study of incidence of various etiologic types of heart disease in Iowa; review of one thousand three hundred and twenty-nine cases. J. Iowa Med. Soc., 23:125, 1933.

ETIOLOGY

Congenital Heart Disease. Aitken has tabulated the thirty-seven cases of congenital heart block reported in the literature and has reported two personally observed cases. The author states that the diagnosis of congenital heart block depends on graphic observations with a history of a slow pulse from an early age, or the absence of a history of any infection that might cause the condition after birth. A large proportion of the cases present other congenital heart abnormalities, the gross pathologic symptoms being associated with these other lesions rather than with the heart block. In three of the reported cases in which there was no other congenital cardiac abnormality the patients were healthy, well-grown people whose response to exercise was good.

Bland, White, and *Garland* have reported the case of a male infant dying at the age of three months, with an abnormal origin of the left coronary artery from the pulmonary artery, associated with marked enlargement of the heart (due to hypertrophy and dilatation of the left ventricle) together with extensive degenerative changes in the ventricular wall supplied by the malposed vessel. "In view of these findings," the authors state, "it is probable that the paroxysmal attacks of acute discomfort precipitated by exertion and associated with profound vasomotor collapse occurring in this infant were those of angina pectoris. The electrocardiographic picture in this case was similar to that seen in adults with important coronary disease. In the few recorded cases (eight in number in addition to our own) of this rare anomaly a characteristic pathological picture has resulted. Death within the first year has been the rule. Two of the cases have been exceptional."

A review of congenital variations in the coronary vessels and a discussion of their embryological background are included. A bibliography is appended.

Farber and *Hubbard* have reported four cases of fetal endomyocarditis together with summaries of ten other reported cases. All were free from evidence of congenital syphilis. In each there was gross and microscopic evidenee pointing to old infection. The nature of the infection was uncertain.

Lewis has reported nine new cases of coarctation of the aorta of the adult type with three autopsies. High blood pressure was a feature in all cases. The femoral arterial upstroke lagged behind the radial by an average of 0.032 second and the summit of the femoral behind that of the radial by 0.145 second on the average. Systolic murmurs were found distributed along the dilated internal mammary arteries.

McGinn and *White* have discussed interauricular septal defect associated with mitral stenosis, and have reported a new case (aged fifty-six years). The diagnosis of this combination of lesions may be made from the fairly typical roentgenogram and suggestive clinical signs. The roentgenogram corresponds with the postmortem findings, showing a large rounded heart especially prominent to the right, an exaggerated pulmonary conus, wide lung hilus markings, and a narrow aorta.

Robinson has reported an apparently unique case of complete situs inversus with auricular fibrillation changed to normal rhythm (with premature beats) by quinidine in a woman forty years old.

Sprague, Ernlund, and *Albright* have discussed the clinical aspects of persistent right aortic arch. "Two cases are reported of dysphagia lusoria resulting from persistence of the right fourth aortic root as the first part of the definitive aorta passing behind the trachea and esophagus. This anomaly was unassociated with other demonstrable cardiovascular abnormalities. The symptoms began in otherwise healthy women at the ages of fifteen and thirty. The importance of a knowledge of this condition in the differential diagnosis of dysphagia as well as of some other symptoms is stressed. The suggestion is advanced that surgical relief should be attempted in cases with progressive disabling symptoms, in the hope of finding an obliterated ductus arteriosus or remnant of the fourth left aortic arch which could be divided to release pressure on trachea or esophagus."

Aitken, J. K.: Congenital heart-block. Lancet, 2:1375, 1932.
Bland, E. F.; White, P. D., and Garland, J.: Congenital anomalies of the coronary arteries: report of an unusual case associated with cardiac hypertrophy. Am. Heart J., 8:787, 1933.
Farber, S., and Hubbard, J.: Fetal endomyocarditis: intrauterine infection as the cause of congenital cardiac anomalies. Am. J. M. Sc., 186:705, 1933.
Lewis, T.: Material relating to coarctation of the aorta of the adult type. Heart, 16:205, 1933.
McGinn, S., and White, P. D.: Interauricular septal defect associated with mitral stenosis. Am. Heart J., 9:1, 1933.
Robinson, H. A.: Complete situs transversus with auricular fibrillation and flutter. Report of a case. Ann. Int. Med., 6:948, 1933.
Sprague, H. B.; Ernlund, C. H., and Albright, F.: Clinical aspects of persistent right aortic root. New Eng. J. Med., 209:679, 1933.

Rheumatic Heart Disease. Coburn has reported an analysis of the relationship of the rheumatic process to the development of alterations in tissues in a series of 320 patients who died with rheumatic disease and who, in most instances, were examined postmortem. He found that "the evolution of rheumatic fever

consists of, first, a phase in which there is an infection of the respiratory tract with the hemolytic streptococcus; second, a symptom-free phase in which the immune response develops in the rheumatic subject, and finally, the acute attack. During the third phase, activity of the rheumatic process is characterized clinically by a tendency to hemorrhage which is well correlated with the anatomic observations." Later in the evolution of the disease the specific Aschoff bodies appear, scattered throughout the body, and finally there may be subcutaneous nodules. "The constant proximity of the Aschoff cells to necrotic collagen in these myocardial nodules suggests the process of healing."

In a series of interesting and important publications including the present report *Klinge* has recorded the results of extensive histological studies on individuals dying of acute rheumatic fever. Further, he has extended his investigations to certain experimental studies in animals. As a result of these studies the author believes that the essential pathology of rheumatic fever is primarily the result of imbibition of collagen fibers. The distribution of the lesions occurs in patches with foci in the vicinity of the pharynx, in the myocardium, the various serous surfaces, and in the synovial membrane of the joints. In view of the distribution of the lesions and their prevalence in the vicinity of the pharynx, it is suggested that the primary portal of entry of the infecting agent is by way of the nasopharynx. As a result of his experimental studies the author further believes the specific type of lesion occurring in rheumatic fever to be an allergic reaction.

Coburn, A. F.: Relationship of the rheumatic process to the development of alterations in tissues. Am. J. Dis. Child., 45:933, 1933.
Klinge, F.: Der "Rheumatismus." Pathologisch-anatomische und experimentell-pathologische Tatsachen und ihre Auswertung für das ärztliche Rheumaproblem. Ergebn. d. allg. Path. u. path. Anat., 27:1, 1933.

Subacute Bacterial Endocarditis. Blumgart has reported two cases (a young woman of nineteen years and a schoolgirl of thirteen) of subacute bacterial endocarditis involving the right chambers of the heart in the presence of congenital defects. He writes as follows: "It is not sufficiently recognized that when the pathologic process is confined to the right chambers of the heart the peripheral embolic phenomena and peripheral blood stream infection may be absent. The diagnosis must then be made on the basis of a different but nevertheless characteristic syndrome of symptoms and signs. The syndrome of subacute bacterial endocarditis affecting the right chambers of the heart consists in (1) the presence of a cardiac lesion involving the right chambers of the heart, (2) generalized evidences of infection, i.e., fever, tachycardia, leukocytosis, etc., (3) instead of evidences of peripheral emboli in the greater circulation, the symptoms and signs of protracted atypical pulmonary infection due to multiple septic infarcts. Only in the far-advanced stages of the disease when necrosis of the septic pulmonary infarcts occurs may organisms be released from the lungs into the greater circulation. The more usual features of the disease may then appear and positive blood cultures may be obtained."

Libman has presented short summaries of seventeen cases which are analyzed in regard to recovery, or to recovery and recurrence of subacute bacterial endocarditis.

Blumgart, H. L.: Clinical syndrome of subacute bacterial endocarditis involving right chambers of the heart. M. Clin. N. Amer., 16:881, 1933.
Libman, E.: A further report on recovery and recurrence in subacute bacterial endocarditis. Tr. A. Am. Phys., 48:44, 1933.

Cardiovascular Syphilis. White has written on the diagnosis of cardiovascular syphilis based on the study of an analysis of two groups of cases, seventy-eight clinical cases of his own seen in private practice and fifty autopsied cases at the Massachusetts General Hospital, both groups being seen over the same period of the last ten years. The writer concludes that "the diagnosis of cardiovascular syphilis is easy in some cases, difficult in many, and impossible in at least a few. The only pathognomonic evidence is that of aneurysmal dilatation of the aorta, saccular or diffuse, but since such cases make up but a small percentage of the total, it is necessary to gather together all the scraps of evidence, large and small, and to weigh them with great care. Fortunately in some cases slight aortic lues, whether diagnosed or not, plays no important rôle, producing neither symptoms nor signs and responsible for neither disability nor death. This may offset, a little, the fact that in such cases clinical diagnosis of the condition is virtually impossible but it should not lull us into an unjustified feeling of security or cause us to be careless in the accumulation or analysis of evidence in any case, for the earlier the diagnosis, the more helpful is the treatment."

White, P. D.: The diagnosis of cardiovascular syphilis. New Eng. J. Med., 208:179, 1933.

OTHER INFECTIONS

Tuberculosis. Austrian has written an excellent discussion of the relationship of heart disease and tuberculosis in a leaflet published by the American Heart Association.

Gellerstedt and *Säfwenberg* have described a case of arrosion of the abdominal aorta due to an old cheesy paravertebral tuberculosis of the lymph nodes. The twenty cases of tuberculosis of the aorta with formation of aneurysm found in the literature are cited. The diagnosis has not yet been made during life, but in the author's opinion this should theoretically not be impossible.

Thompson has summarized twenty-one cases of primary pericardial tuberculosis reported in the literature and has added seven cases of his own from the Presbyterian Hospital, New York. The age of the patients was advanced, the average being 69.5 years and the range from forty-nine to eighty-four years. The onset is insidious. Unexplained fever and progressive cardiac insufficiency are the characteristic findings.

Diphtheria. Hartl and *Richter* have published a report of a study of the electrocardiographic and clinical findings in forty-four diphtheria patients, thirteen of whom died. Four groups were differentiated: (1) pure vasomotor collapse, (2) bundle branch block, (3) auriculoventricular block, and (4) late heart damage with negative T waves in two leads. Eight to twelve months after the illness these signs had disappeared.

Cholera. Bien and *Tung* have correlated the electrocardiograms of eleven cases of cholera with the chemical and blood studies. "In summary, while there is, no doubt, a very great disturbance of the circulation in cholera, which would appear to be principally dependent upon dehydration, the electrocardiogram does not show changes which seem to be specific or which lend themselves to analysis. If the shift toward the acid side of plasma reaction has a specific effect on the cardiac mechanism, it would seem to be masked by other effects."

Miscellaneous. Kenny and *Sanes* have reported two cases of dilatation and hypertrophy of the heart due to parenchymatous myocarditis in infancy. In both cases acute infection preceded cardiac symptoms and enlargement (bronchopneumonia in one, stomatitis in the other). The first case was a female, aged one year. At postmortem examination there was vacuolar degeneration. The heart weight was 85 grams. There were many small fat granules. The second case was a male, aged six months. At postmortem examination there were granular degeneration and a white fibrosed endocardium. The heart weight was 65 grams. Bronchopneumonia was the cause of death in the first case; hemopericardium from paracentesis (70 cc.) was the cause of death in the second case.

Austrian, C. R.: Heart Disease and Its Relation to Tuberculosis. Modern Concepts of Cardiovascular Disease, March, 1933, II, No. 3.

Bien, C. W., and Tung, C.-L.: Electrocardiographic changes in cholera. Chinese M. J., 47:662, 1933.

Gellerstedt, N., and Säfwenberg, O.: Zur Kenntnis der Aortatuberkulose und des tuberkulösen Arrosionsaneurysmas der Aorta. Upsala Läkaref. forh., 38:165, 1933.

Hartl, K., and Richter, W.: Erkennung und Vorhersage des diphtherischen Kreislaufschadens durch die Herzstromkurve. Deutsches Arch. f. klin. Med., 175:320, 1933.

Kenny, F. E., and Sanes, S.: Dilatation and hypertrophy of the heart in infancy due to parenchymatous myocarditis. J. Pediatrics, 3:321, 1933.

Thompson, W. P.: Primary tuberculosis of the pericardium. J. A. M. A., 100:642, 1933.

THE HEART IN THYROID DISEASE

Myxedema. Lerman, Clark, and *Means,* after a careful study of x-ray records of thirty cases of myxedema and of electrocardiograms of twenty-four cases have presented the following conclusions: "The heart is generally enlarged in myxedema. After thyroid medication, the size of the heart, in most cases, undergoes a progressive shrinkage, which reaches its maximum as a rule in three to six months. This decrease is of diagnostic value. The amount of reduction in the size of the heart is proportional to the degree of cardiac enlargement. [In one of the authors' cases the transverse diameter of the heart by teleroentgenogram decreased from 19.3 to 12.4 cm. in six months, in another from 21.4 to 15.7 cm., in six weeks, in a third from 16.5 to 11.4 cm. in 8½ months, and in a fourth from 19.4 to 15.5 in five months.] The failure of some patients to show cardiac change after thyroid medication may be explained on the basis either of long-standing hypertension or of the fact that the heart is not enlarged before treatment. . . .

"The electrocardiogram in myxedema is always abnormal. The most common abnormality is a flattening or inversion of the T waves, particularly in Lead II. In addition, abnormal axis deviation and small P and Q-R-S complexes are common. On thyroid treatment many of the abnormalities disappear wholly or in part. The greatest return to normal occurs in those patients with the most marked shrinkage in the size of the heart. The abnormalities in the electrocardiograms are probably not due to increased skin resistance but to changes in the conduction system of the myocardium (as determined by needle electrodes).

" 'Myxedema heart' in the sense of cardiac enlargement which undergoes shrinkage on thyroid medication is common; in the sense of Zondek and Fahr, i.e., cardiac enlargement in association with congestive failure, it is rare. The heart changes are to be regarded as part of the picture of myxedema, not as a separate cardiac entity. The patients with findings suggestive of cardiac failure usually have hypertension and arteriosclerosis.

"The change in the heart with thyroid treatment is probably due to increased muscle tonus and loss of interstitial edema. In an occasional case the loss of pericardial fluid may account for this change."

Lerman, J.; Clark, R. J., and Means, J. H.: The heart in myxedema; electrocardiograms and roentgen-ray measurements before and after therapy. Ann. Int. Med., 6:1251, 1933.

(To be continued.)

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.

CASE 20481

PRESENTATION OF CASE

A sixty year old single Canadian woman entered complaining of a lump in the right lower side.

Approximately two months before entry the patient went to her physician because of a cold. During the examination he palpated a lump in the right lower quadrant. A gastro-intestinal series was performed following which the lump gradually began to swell and to be painful. Her appetite had been poor during the past month, but there was no nausea, vomiting, diarrhea or constipation. There were no urinary symptoms except a slight nocturia which she had had for the past few years. During the past two weeks the mass became smaller. She had lost about twelve pounds during the past four months. During the last two months she had a slight non-productive cough.

Her father and mother died of what was called a "heavy cold." One sister was living and well. There were no other siblings. There was no tuberculosis, diabetes or cancer.

The past history is non-contributory.

Physical examination showed a frail, dehydrated, elderly woman with evidence of loss in weight. The tongue was smooth. The lungs showed dullness, slightly increased breath sounds and râles over the right upper lobe posteriorly. There were some medium moist râles over the left upper lobe. In the right lower quadrant just above the inguinal ligament was a large oval mass which felt quite superficial. The mass measured approximately 12 by 7 centimeters and was definitely tender. The skin over the mass was reddened and the veins were prominent.

The temperature was 101°, the pulse 103. The respirations were 20.

Laboratory examination of the urine was negative. Examination of the blood showed a red cell count of 3,060,000, with a hemoglobin of 70 per cent. The white cell count was 6,400, 71 per cent polymorphonuclears. A stool examination showed a negative guaiac test.

A flat abdominal x-ray plate showed no evidence of urinary calculi. There was calcification of the pelvic vessels and no definite x-ray evidence of metastatic malignant disease. A barium enema showed a large tubular filling defect of the colon which appeared to start at the hepatic flexure and extended downward toward the cecum for a distance of six inches. It was surrounded by a hard soft tissue mass and was fixed. The cecum was not spastic. A film taken of the chest showed slight mottling in the infraclavicular region associated with slight thickness of the right apical pleura.

On the seventh day an exploratory laparotomy revealed a large inflammatory mass around the cecum and an ileotransverse colostomy was performed. She did poorly postoperatively. Her temperature was picket fence in character, ranging between 98° and 102°. On the twelfth postoperative day her temperature rose to 103° and she became intermittently irrational. A fluctuant mass was felt in the right lower quadrant. This was incised and drained under gas-oxygen anesthesia. Following operation her chart was comparatively flat for the next three weeks and she appeared improved. During the fourth week, however, she began to fail rapidly, became comatose and died.

DIFFERENTIAL DIAGNOSIS

DR. LELAND S. MCKITTRICK: A painless mass in the right lower quadrant may represent either a retroperitoneal or an abdominal tumor, but is probably more frequently a carcinoma of the cecum or ascending colon than any other one single lesion.

By gastro-intestinal series, I presume that barium was given by mouth. Whether this would stimulate peristalsis and aggravate a lesion in the right colon, I do not know. I presume it might. Certainly, the giving of barium by mouth to a patient with a mass in the abdomen which is expected to be seen in the colon is not desirable until the barium first has been given by rectum to exclude an obstructive lesion.

The absence of nausea, vomiting, diarrhea, or constipation does not exclude the colon as the site of the lesion. Whether there is any connection between her slight, non-productive cough of two months' duration, and the "heavy cold" from which her father and mother "died", we can only speculate. We also again have no evidence which will permit us to associate the mass in the right side with the clinical findings of the chest. At this point we can only speculate as to whether this is a retroperitoneal tumor, a carcinoma of the ascending colon, tuberculosis, or an inflammatory mass possibly secondary to an appendix, or a lymphosarcoma.

If the redness of the skin overlying the mass is due directly to the underlying process, it would strongly suggest that at least a part of the mass is inflammatory. This would be quite in keeping with a primary lesion in the bowel

and might be present whether this lesion were carcinoma, tuberculosis or any other ulcerating process.

The red cell count and hemoglobin are of no value. They are consistent with any one of the lesions mentioned. Likewise, I presume that one ought not to be influenced by a white cell count of only 6400 with 70 per cent polymorphonuclears. No matter what the underlying process, one would expect a somewhat higher count than this because of the secondary infection which is undoubtedly present.

The single stool examination means nothing.

"There was calcification of the pelvic vessels and no definite x-ray evidence of metastatic malignant disease." Dr. Holmes will tell us what he means by the latter. Possibly it is in relation to the spine or bones of the pelvis.

"A barium enema showed a large tubular filling defect of the colon which appeared to start at the hepatic flexure and extended downward toward the cecum for a distance of six inches." That is the first evidence we have that associates this mass with the colon itself.

It would be well if Dr. Holmes would go over the x-rays with us.

X-ray Interpretation

Dr. George W. Holmes: This is the chest film. I can add nothing to what has already been said in the report. It is essentially negative.

A film taken of the urinary tract shows the kidney outlines distinctly on both sides. You will notice that the left kidney is large and the right small. It also shows distinctly the edge of the liver. The report states that there were no stones and no evidence of metastatic involvement was found in the pelvis.

A Physician: Do you think the chest is negative, Dr. Holmes?

Dr. Holmes: The diaphragm is perhaps a little flattened and wavy on the right side. The markings are rather prominent but there is nothing characteristic about them. There is also some thickening at the extreme right apex. None of these changes represent active disease.

Dr. McKittrick: Is there anything to hook up with the râles and the findings in the chest?

Dr. Holmes: No.

This film shows the lesion described in the colon. That is the region of the hepatic flexure, here the transverse colon, and here the cecum.

Dr. McKittrick: The part in the center fills fairly well.

Dr. Holmes: Yes. We have two definite lesions that may run into one another; but there are certainly two distinct areas with rather smooth sharply defined margins and no evidence of spasm. When the enema is injected an ulcerating lesion, particularly a tuberculous lesion, is apt to produce a severe spasm with rapid ejection of the barium from the cecum.

Dr. McKittrick: Does either one of these show the hard soft-tissue mass that is mentioned?

Dr. Holmes: I am not able to point it out. Very likely the man who did the examination was able to feel it in relation to the barium filled cecum.

Dr. McKittrick: Is that after evacuation? The mucosal markings in the lower portion of the bowel were normal?

Dr. Holmes: As far as we can make out they were normal at this point.

We have a small film. This is the area of the lesion. You can see two annular lesions in the region of the hepatic flexure with rather smooth margins and no evidence of ulceration.

Dr. McKittrick: I was in trouble enough with one lesion. Now there are two.

Dr. Holmes: I think the fact that there are two ought to help you.

Differential Diagnosis Continued

Dr. McKittrick: Up to this point certainly the most probable lesions have already been mentioned, tuberculosis, carcinoma of the colon, and an inflammatory process. The appendix I think we can rule out. I presume there is no reason one cannot get a localized inflammatory process of the ileum. Tuberculosis I think is quite unlikely. Tuberculosis of the colon without tuberculosis of the lungs is uncommon, and, as Dr. Holmes has pointed out, the x-ray findings are not what one would expect to find in the usual tuberculous lesion of the colon. My experience with tuberculosis of the colon is small, however, but I find it difficult to visualize a tuberculous lesion of the colon without an accompanying history of more definite symptoms referable to the large bowel.

Dr. Holmes: I hope that my remarks have not been misleading. I would not rule out the other form of tuberculosis.

Dr. McKittrick: Not at all. While I cannot exclude tuberculosis the presence of a palpable mass involving the bowel without other evidence of tuberculosis makes it seem unlikely. I should expect an inflammatory mass to have given more definite symptoms of pain and local tenderness at the onset; also, such a process, except one secondary to an appendicitis, is very rare on the right side. This would seem to be too high for the appendix. I cannot exclude a lymphosarcoma but I do not believe that such will be found. I believe the lesion to be more probably an unusual form of tuberculosis or a cancer of the right colon, which the x-ray has localized in the region of the ascending colon or hepatic flexure. The x-ray findings are not those typically found in carcinoma, but I believe this to be the most probable and, therefore, make a diagnosis of cancer of the right colon.

Clinical Discussion

Dr. Tracy B. Mallory: Dr. Parsons will tell us a little more about the operation.

Dr. Langdon Parsons: Dr. McKittrick called attention to the fact that it was rather a poor idea to do a gastro-intestinal series in a person with a tender palpable mass. As a matter of fact the barium was given by enema and the examination outside the hospital was similar to the one done here which you have just heard discussed. The man who did the examination also added that he had recently seen a case of tuberculosis of the cecum with similar findings but his diagnosis, as far as he could make out on the examination, was carcinoma of the cecum rather than tuberculosis.

One interesting thing from the patient's point of view was that following the emergency barium enema, done two months before, she developed pain in the right lower quadrant and the mass became larger but she did nothing about it. Perforation possibly took place at that time. There was an easily palpable, hard soft-tissue mass which probably was red because she was applying heat for relief. The symptoms were chiefly pain in relation to the mass rather than obstructive symptoms, although she undoubtedly had slight obstruction.

At the time of operation, as the patient lay on the table, we could see the mass. It was reddened with distended veins over its surface, but it was not fluctuant at any point at that time. The abdomen was explored. It was impossible, however, to explore the right lower quadrant at all because of a matted, fixed, hard mass. Dr. McKittrick questioned its being around the cecum. It involved the whole right gutter and obviously could not be resected. We felt that it was possibly a malignant perforation and a secondary inflammatory process around the cecum and ascending colon. The only operative procedure indicated was an ileotransverse anastomosis and attempt to short-circuit the bowel with the possibility of a secondary operation later. The liver was absolutely negative and the remainder of the abdomen as far as we could tell was free of disease.

Following the first operation she went along all right for two weeks and then suddenly one morning collapsed and went into shock. The mass in the right lower quadrant had become much larger and was now fluctuant. I drained it under local anesthesia in bed. The whole abdominal wall was undermined and you could put your finger through a perforation in the muscular layer.

Dr. Mallory: Dr. Holmes, have you anything to add?

Dr. Holmes: I should like to comment on the diagnosis of tuberculosis by x-ray examination. I think we are apt to overlook the fact that there are two distinct forms of tuberculosis of the cecum and terminal ileum. One is the ulcerative type that occurs almost invariably in people with advanced tuberculosis, probably from swallowing tubercle bacilli in the sputum, and is the common type. In the other form there is a hard tumor mass around some portion of the bowel, usually the cecum or terminal ileum, without ulceration and without evidence of tuberculosis in the lung. In these cases there is absence of spasm, as in this patient. As to the question of a multiple lesion, in our experience a multiple lesion in the gastro-intestinal tract has been lymphoma more often than any other single disease. In this case we cannot be sure that this is a multiple lesion; if we could we ought to think more seriously of lymphoma than of carcinoma as the primary cause.

I should also like to say just a word in regard to the question of barium meals. I agree in general with what has been said, but I think the danger is very much overestimated. If the operator knows that the patient has a certain degree of obstruction and if it is highly desirable to have an examination with the meal it can be done safely by using a small amount of barium mixed with petrolagar. With this technique the patient is in no more danger of obstruction than he would be from eating ordinary food.

Clinical Diagnoses

Carcinoma of ascending colon.
Retroperitoneal abscess.

Dr. McKittrick's Diagnosis

Cancer of right colon.

Anatomic Diagnoses

Tuberculous ileitis, typhlitis, appendicitis and colitis.
Soft-tissue abscess of abdominal wall with appendiceal fistula.
Tuberculous adenitis, retroperitoneal.
Operative wounds: transverse ileocolostomy; drainage of abscess of abdominal wall.
Endometrial polyp.
Arteriosclerosis: moderate aortic, slight coronary.
Benign nephrosclerosis.
Pleuritis, chronic fibrous, bilateral.

Pathologic Discussion

Dr. Mallory: The diagnosis in this case was never settled until autopsy but it was then obvious as you will see from the picture. In this colored plate of the cecum and terminal ileum you can see several separate ulcers. The mucosa between them is thrown into folds and especially at the edges of the ulcers is slightly polypoid, but there is nothing there to suggest

a malignant lesion. Microscopically the picture is that of a typical tuberculosis. It turned out that there were multiple ulcers in the cecum, the ascending colon, the base of the appendix, and the terminal ileum. If barium had been given by mouth the lesion in the ileum might have been picked up in this case and it might have helped in establishing the diagnosis. The final acute episode was the rupture of the ulcer in the appendix with a resulting abscess which had to be drained.

Dr. Holmes pointed out that the two kidneys were of different size. That was checked at autopsy, one weighing 50 grams and the other 150, making a total weight of 200 grams, which is distinctly below normal. However, no pathology was found in the smaller kidney, and such congenital variations are not unusual.

The lungs showed no active tuberculosis whatever. There was a scar, about 2 centimeters in diameter, of an old healed process at one apex. The only progressive lesions in the body were those in the intestinal tract.

DR. PARSONS: May I say a word? Dr. McKittrick said that he questioned the diagnosis of tuberculosis on the basis of the fact that there was very little to see in the chest. I went over about forty-three cases of intestinal tuberculosis and they were about equally divided. Of the forty-three cases seventeen showed no evidence of chest involvement at all. I took a similar group of fifty-two cases of carcinoma of the cecum. Not all had chest plates but of the seventeen that had plates four showed tuberculosis and the others showed no evidence of it.

DR. MALLORY: I think particularly in these very old people that is apt to be the case. Tuberculosis of the intestinal tract without any active tuberculosis in the chest is fairly common.

CASE 20482

PRESENTATION OF CASE

A twelve year old American schoolgirl entered complaining of severe bloody diarrhea.

Two years before entry the patient had diarrhea lasting for about three months. She had about five movements a day. The stools were soft but not always watery and were accompanied by mucus and some blood. She was anemic and also had fainting spells. Her appetite was poor but she did not vomit or lose weight. There was no rectal or abdominal tenderness. About fifteen months before entry she improved somewhat, having only three movements a day. The mucus decreased and blood was seen only occasionally. Her fainting spells had ceased. Her appetite continued to be poor and she failed to gain weight. Six months before admission her condition became much more critical. She had ten to twelve movements a day associated with incontinence and tenesmus. The stools were foul smelling, usually watery, and contained mucus and almost always blood. Two or three times a week she complained of abdominal cramps which were not associated with vomiting.

Her mother, father and siblings were living and well. There was one stillbirth. Her paternal grandfather died of cancer. There were four cases of tuberculosis in her mother's family. There was no family history of any allergic diseases.

At birth the patient was a full-term, normally developed baby. She had had measles, pertussis, chicken pox and mumps. She developed normally and had no serious diseases. Five years before entry she had a tonsillectomy and adenoidectomy. Recently she complained of pain on urination. Her catamenia had not begun.

Physical examination showed a fairly well-developed and nourished child who did not look ill. She was somewhat underweight and temperamental. The heart and lungs were negative. The spleen and liver could not be felt. The right lower quadrant was resistant but not tender. Rectal examination revealed a firm nodular growth which had entirely surrounded the anal canal and which seemed to extend up into the rectum. The examiner was able to get a finger about three inches up but could not get above the tumor. There was an old bloody discharge from the anus.

The temperature was 100°, the pulse 105. The respirations were 24.

Laboratory examination of the urine was negative. Examination of the blood showed a red cell count of 5,170,000, with a hemoglobin of 80 per cent. The white cell count was 9,000, 64 per cent polymorphonuclears. The stools were grayish yellow and no pathogenic organisms could be isolated. They contained mucus and blood. A tuberculin test 1:1000 was positive at the end of forty-eight hours. A Hinton test was negative.

X-ray examination of the chest was negative. Examination of the abdomen showed calcified glands over the entire transverse process of the third lumbar vertebra. A barium enema showed a very narrow lumen to the terminal rectum. The colon was filled with barium and an examination after evacuation showed practically no emptying.

Proctoscopic examination showed a sessile ulcerated mass about one centimeter in diameter just inside the anal sphincter. The tumor also involved the rectovaginal septum. Approximately four centimeters above the anus there was a hard indurated mass extending around the entire circumference of the bowel at the upper end of which was a stricture which barely admitted the tip of the finger.

On the twelfth day an exploratory laparotomy was performed.

Differential Diagnosis

Dr. E. Parker Hayden: A chronic bloody diarrhea is not often seen in a child of this age and yet any of the diseases producing ulcerative lesions in the intestine may occur and do occur in children.

The early history suggests an inflammatory lesion rather than a neoplasm. A two year history, ushered in by three months of frequent stools, mucus, and blood, and which subsequently improved considerably, only to become worse again after another nine months or so, is not the usual history of malignant tumor of the bowel. The intermittent abdominal cramps without vomiting suggest the discomfort of an inflamed colon rather than attacks of mechanical obstruction, although we do know from the physical examination that there was a definite constriction of the rectum. Chronic ulcerative colitis occasionally occurs at this age but does not in itself produce a definite localized tumor-like formation with constriction. Carcinoma has been reported in association with ulcerative colitis, however. The child had a positive tuberculin test,—not in itself of significance at her age—calcified glands in the abdomen, and a negative chest, as revealed by x-ray examination, and four relatives on the mother's side were said to have died of tuberculosis. Hyperplastic tuberculosis, though it may occur in the left colon or rectum, is much more common in the cecum, and is not characterized by bloody diarrhea as a rule. Obstructive symptoms with a palpable tumor are more common early symptoms of this disease. A tuberculous enteritis occurs, I believe, always in association with advanced tuberculosis elsewhere in the body, a situation that probably did not exist in this girl.

It is of interest that the child on admission showed no anemia after two years of frequent stools with blood loss, though she had been considered anemic earlier in the course of the disease. The blood showed no evidence of acute infection. Some fever was present, however,—an uncommon finding in association with cancer except after abscess formation. This further suggests an inflammatory lesion.

The child had recently complained of dysuria though a specimen was negative. This symptom was probably due to bladder irritation from the adjacent bowel pathology.

On physical examination the girl appeared well developed and nourished and not ill. There was resistance in the right side of the abdomen but no tenderness. A firm nodular growth was found encircling the lower rectum and extending upward three inches or more. The examining finger could not be passed above it. Proctoscopic examination describes a one centimeter sessile ulcerated mass just above the sphincter, with the main mass lying farther up the rectum, annular, and with its point of greatest narrowing at the upper end. This latter point is very characteristic of an inflammatory tubular stricture, but if there really was a separate sessile mass below the annular one and if the annular mass was really nodular, the situation then becomes more suggestive of malignancy. Diagnosis must rest largely on what the digital and proctoscopic examination conveyed to the man who did it, but this fact is not available to us as yet. A biopsy would naturally have been done also.

The relationship of benign rectal strictures to lymphogranuloma inguinale, as established by application of the Frei test, is becoming increasingly evident. In the early stages of this disease there is an acute proctitis with long-continued ulceration, bleeding, and frequent evacuations. One would not expect this disease in a young child, but it is of course possible.

Lastly, one should mention the possibility of a lymphosarcoma of the rectum. The presence of some temperature would be consistent with such a diagnosis, but the long history of bloody diarrhea rules it out fairly definitely. I believe the child had either an inflammatory rectal stricture with ulceration above and below it, or a carcinoma superimposed on a chronic ulcerative colitis.

Clinical Discussion

Dr. Harold L. Higgins: The occurrence of blood and mucus in the stools indicates an ulcerative colitis and its long duration establishes the diagnosis of chronic ulcerative colitis.

Chronic ulcerative colitis in children has been less frequently seen during the last fifteen years with the diminished incidence of tuberculosis and acute dysentery in children. However, it never has been a frequent condition. Recently we have seen only an occasional case, and the etiology has been about equally divided among four groups, dysentery, idiopathic ulcerative colitis, tuberculosis and neoplasm.

In this case, the ability to digest and absorb food has not been greatly impaired; the nutrition is fair and there is no anemia and no avitaminosis. These symptoms when present are indicative, however, of concomitant enteritis or indigestion in the small intestine.

The occurrence of a nodular and annular mass about the rectum of a child is a rare finding in children; I recall no similar instance in my experience.

Preoperative Diagnosis

Carcinoma of the rectum.

Dr. Hayden's Diagnoses

Inflammatory rectal stricture.
Carcinoma of the rectum?

Pathologic Diagnosis

Colloid adenocarcinoma of the rectum with metastases.

Pathologic Discussion

Dr. Tracy B. Mallory: At the time of the proctoscopy, biopsy specimens were removed from both the small sessile tumor and the larger constricting mass. Both showed typical colloid adenocarcinoma on microscopic examination. Since operation offered the only possible hope, an exploratory laparotomy was performed by Dr. Robert Linton. He found a large growth which was firmly adherent to the surrounding structures, especially anteriorly. Although the liver seemed free from metastases as far as could be determined by palpation, numerous metastases were found in the retroperitoneal lymph nodes running up along the aorta. The tumor was evidently inoperable. One of the aortic lymph nodes was removed for confirmation of the diagnosis and showed on histologic examination colloid adenocarcinoma. The presacral nerves were isolated and severed at the bifurcation of the aorta in order to relieve the local discomfort.

The New England
Journal of Medicine

SUCCESSOR TO

THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

COMMITTEE ON PUBLICATIONS

R. I. LEE, M.D., *Chairman* HOMER GAGE, M.D.
R. B. OSGOOD, M.D. R. M. SMITH, M.D.
F. H. LAHEY, M.D.

EDITORIAL STAFF

REID HUNT, M.D. STEPHEN RUSHMORE, M.D.
JOHN P. SUTHERLAND, M.D. HANS ZINSSER, M.D.
GEORGE R. MINOT, M.D. BENJAMIN WHITE, PH.D.
FRANK H. LAHEY, M.D. HENRY R. VIETS, M.D.
SHIELDS WARREN, M.D. ROBERT N. NYE, M.D.
GEORGE L. TOBEY, JR., M.D. ROBERT M. GREEN, M.D.
C. GUY LANE, M.D. CHARLES C. LUND, M.D.
WILLIAM A. ROGERS, M.D.

WALTER P. BOWERS, M.D., *Managing Editor*

ASSOCIATE EDITORS

GEORGE G. SMITH, M.D. WILLIAM B. BREED, M.D.
JOSEPH GARLAND, M.D.

THE NEW HAMPSHIRE MEDICAL SOCIETY

PUBLICATION COMMITTEE

CARLETON R. METCALF, M.D. HENRY H. AMSDEN, M.D.
WARREN H. BUTTERFIELD, M.D.

THE VERMONT STATE MEDICAL SOCIETY

PUBLICATION COMMITTEE

WILLIAM G. RICKER, M.D. C. F. DALTON, M.D.
L. H. ROSS, M.D.

SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, Canada $7.04 per year, $8.52 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 8 Fenway.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 8 Fenway, Boston, Mass.

HONI SOIT QUI MAL Y PENSE

RESIGNATION from the Public Health Committee of the National Advisory Council on Radio in Education was announced on November 20 by Dr. Thomas Parran, Jr., New York State Commissioner of Health, according to a recent news service release of the New York State Department of Health.

"Doctor Parran's action," this despatch continues, "was based upon a last-minute ban by the Columbia Broadcasting System on any mention of syphilis control in a talk on 'Public Health Needs' which Dr. Parran had been invited to give on a nation-wide hookup. A brief non-technical reference to life-saving possibilities through scientific action in the control of the disease had been specifically approved by Levering Tyson, Secretary and Director of the Advisory Council." Dr. Parran, commenting on the action of the Columbia Broadcasting System in refusing to broadcast the speech with its mention of syphilis control among urgent public health needs, pointed out that a hopeful view of relief from this dangerous malady might be more welcome to the half million persons in the United States who acquire the disease each year than the veiled obscenity permitted by Columbia in the vaudeville acts of certain of its commercial programs.

It is a pity indeed that radio, with perhaps the greatest opportunities for educational publicity that have ever existed, should so often shoot wide of the mark. Possibly we should content ourselves with the philosophical reflection that man is still not big enough to avail himself of the machines that his ingenuity has devised. There is something a little pitiful and a little futile, however,—were it not that the individual instance represents a serious matter—in the way that Big Business takes its morals; throwing an entirely meritless sop to a completely outworn respectability; washing over the lusty hues of a postwar period with the weak water colors of a nineteenth century prudishness.

Possibly the self-appointed guardians of a nation's morals, purveyors of a publicity such as has never before been known, may yet be brought to realize the fact that syphilis is a curable disease, more susceptible to control than is tuberculosis, if only the facts could be made universally known and hammered home. Until this stage in its progress has been reached we must accept what many of us have already suspected—that if radio is still in its infancy, that infancy is not so much a matter of technique as of intellect.

BOSTON COUNCIL OF SOCIAL AGENCIES

THE Boston Council of Social Agencies, organized as a federation of the social work interests and activities of the community, should include all public departments and private organizations whose work is concerned with the social welfare of the inhabitants of the city. The most important aspects of the Council work are the coördination of activities and the raising of the standards of work performed; on this account it is desirable that as many as possible of the agencies and departments of the city be enrolled and that they show a willingness to coöperate with others in raising standards. To this end it has been proposed that membership in the Council be tested by certain considerations, and reasonable standards of membership adopted.

From the administrative standpoint it is proposed that each private agency have a board of active and interested directors, and that public departments have either an administrative or advisory committee or be related in some constitutional way to the responsible head of the political unit which they represent. Membership in the Council should be with the approval of such governing boards or superior officers.

Private agencies should be organized accord-

ing to the legal requirements pertaining to the conduct of charitable corporations.

The accounting method of every social agency should be kept in line with standard business requirements in such a way as to show sources of income and manner of expenditure, with records indicating the type of funds held and the legal terms on which trusts are held. It is further proposed that agencies be operated on definite budgets with yearly audits made by a public accountant, and that officers handling considerable sums of money should be bonded.

Every agency should keep adequate records of its work and should prepare an annual report containing a summary of service rendered with a summary of the financial condition of the organization.

The proposal is also made that each agency should periodically analyze its own activities in its relation to social conditions, in order that its program may be adapted to the changing needs of a growing city. Further, both public and private organizations should do everything possible in coördinating the activities of all and in seeing that new needs are promptly and wisely met. To accomplish these goals the methods and objectives of the member agencies should measure favorably with the best practices of agencies in that particular field throughout the country.

These, in brief, are the standards which have been proposed for membership in order that the necessary work may be effectively accomplished, and yet without requirements so rigid as to limit in any handicapping way the number of agencies which should belong to the Council. These standards will be equally applicable to the Boston Health League, which, although a corporate entity, is the Department of Health of the Council.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

HOMANS, JOHN. M.D. Harvard University Medical School 1903. Surgeon to Peter Bent Brigham Hospital. Clinical Professor of Surgery, Harvard Medical School. His subject is "Thrombosis of the Deep Veins of the Lower Leg, Causing Pulmonary Embolism." Page 993. Address: 721 Huntington Avenue, Boston, Massachusetts.

SCHALL, LEROY A. M.D. Jefferson Medical College 1917. F.A.C.S. Instructor in Laryngology, Harvard University Medical School. Associate Surgeon, Massachusetts Eye and Ear Infirmary and Massachusetts General Hospital. Visiting Surgeon, New England Peabody Home for Crippled Children. Assistant Laryngologist, Robert B. Brigham, Palmer Memorial, and Huntington Memorial Hospitals. His subject is "Carcinoma of the Tonsil. A Statistical Study of Two Hundred and Thirty Cases." Page 997. Address: 270 Commonwealth Avenue, Boston, Massachusetts.

VAN RAVENSWAAY, A. C. M.D. Washington University School of Medicine, St. Louis, 1932. Formerly: House Officer in Pathology, Massachusetts General Hospital. Now: Assistant in Medicine, Washington University School of Medicine. His subject is "The Heterophile Agglutination Test in the Diagnosis of Infectious Mononucleosis." Page 1001. Address: Barnes Hospital, St. Louis, Missouri.

COTTON, FREDERIC J. A.B., A.M., M.D. Harvard University Medical School 1894. F.A.C.S. Consulting Surgeon, Boston City Hospital, Faulkner Hospital, Newton Hospital, New England Hospital for Women and Children, Chelsea Memorial Hospital, and Cape Cod Hospital, Hyannis. Address: 520 Commonwealth Avenue, Boston, Massachusetts. Associated with him is

MORRISON, GORDON MACKAY. A.B., M.D. Tufts College Medical School 1926. F.A.C.S. Assistant Out-Patient Surgeon, Boston City Hospital. Visiting Surgeon, Chelsea Memorial Hospital. Junior Visiting Surgeon, Newton Hospital. Consulting Surgeon at Huggins Memorial Hospital, Wolfeboro, New Hampshire, Framingham Union Hospital, and Leonard Morse Hospital, Natick. Address: 520 Commonwealth Avenue, Boston, Massachusetts. Their subject is "Industrial Surgery." Page 1004.

LEECH, CLIFTON B. S.B., M.D. Boston University School of Medicine 1919. Cardiologist, Union Hospital, Fall River. Consulting Cardiologist, Cape Cod Hospital and Fall River General Hospital. His subject is "The Austin-Flint Murmur and Its Differential Diagnosis." Page 1007. Address: 211 Angell Street, Providence, Rhode Island.

BLODGETT, J. H. Ph.B., M.D. University of Vermont College of Medicine 1897. Formerly: Vice-President of the Vermont State Medical Society. Now: Chairman, Executive Committee and Attending Physician, New England Kurn Hattin Homes. Address: Bellows Falls, Vermont. Associated with him is

MAYO, W. I., JR. B.S. Formerly: President of Vermont Conference of Social Work. Now: Director of New England Kurn Hattin Homes. Chairman Committee on Handicapped Vermont Country Life Commission. Address: Westminster, Vermont. Their subject is "Observations on Certain Phases of the Health of Sixty-Two Normal Boys Over a Period of a Year Together with a Description of a Method of Routine Physical Examination." Page 1009.

WHITE, PAUL D. A.B., M.D. Harvard University Medical School 1911. Physician, Massachusetts General Hospital. Assistant Professor of Medicine, Harvard Medical School. Address: Massachusetts General Hospital, Boston, Mass. Associated with him is

SPRAGUE, HOWARD B. A.B., M.D. Harvard University Medical School 1922. Assistant Physician, Massachusetts General Hospital. Visiting Physician and Research Director, House of the Good Samaritan. Assistant in Medicine, Harvard Medical School, Courses for Graduates. Address: 270 Commonwealth Avenue, Boston, Massachusetts. Their subject is "Cardiovascular Review of 1933." Page 1015.

MISCELLANY

THE ELECTION OF SURGEON-GENERAL CUMMING

At the ninth Pan-American Sanitary Conference held at Buenos Aires, November, 1934, Surgeon-General Hugh S. Cumming was reëlected Director General of the Pan-American Sanitary Office. Dr. Gregorio Aracz Alfaro of Argentina was elected Honorary President.

The tenth conference will be held in Bogota.

A resolution was adopted recommending that the Pan-American nations ratify the Paris air, navigation and sanitary convention. A conference committee, after a thorough study, decided that this convention provided sufficient protection against the spread of tropical diseases, especially yellow fever, at the same time avoiding the trouble of some of the formalities that would slow up aerial transportation. The Paris convention originally was drawn up to prevent the spread of cholera and yellow fever.

The conference also adopted a resolution interpreting the Pan-American sanitary code as not requiring full bills of health for airplanes.

THE HARVARD-AFRICAN EXPEDITION

The Harvard-African Expedition, under the auspices of the Department of Tropical Medicine of Harvard University, has recently returned to this country. This Expedition, which left in April 1934, under the direction of Dr. Richard P. Strong, particularly carried on medical and biological investigations on onchocerciasis, in the regions of the Belgian Congo. Further research on the material brought back from the Expedition will be completed in the laboratories of the Department by Dr. Strong and Dr. J. H. Sandground.

The Expedition obtained also some 226 bird skins and some 25 mammal skins, collected and prepared by Mr. S. Pierrepont, Jr. A herbarium of some 125 plants was made for the Gray Herbarium by Dr. J. Bequaert, who also collected numerous specimens of miscellaneous insects, mollusks, and other invertebrates which will be additions to the collections of the Museum of Comparative Zoology. A collection of photographs was made by Mr. Henry Mallinckrodt and Mr. Byron L. Bennett.

CORRESPONDENCE

THE SUSPENSION OF THE REGISTRATION OF DR. HUROVITZ

The Commonwealth of Massachusetts
Board of Registration in Medicine

November 20, 1934.

New England Journal of Medicine,

This is to inform you that at a meeting of the Board of Registration in Medicine, held November 15, 1934, it was voted to suspend, for three months, the registration of Dr. Oscar Hurovitz, of 173 Ruthven Street, Roxbury, Massachusetts, for gross misconduct in the practice of his profession, as shown by deceit in the case of a patient treated by him in connection with automobile accident liability insurance.

Very truly yours,
STEPHEN RUSHMORE, M.D., *Secretary.*

THE OPENING OF THE CONTAGIOUS WARD OF THE CHILDREN'S HOSPITAL

November 21, 1934.

Editor, *New England Journal of Medicine,*

I thought it might interest you, and possibly the readers of the *New England Journal of Medicine*, to know that we are opening our Isolation Ward on December 1, and that after that date we will be prepared to receive and care for contagious cases not over fifteen years of age.

Very truly yours,
G. v. L. MEYER, *Director.*

THE MEDICAL PROFESSION AND THE LAY PRESS

November 23, 1934.

Managing Editor, *New England Journal of Medicine,*

Your editorial in the *Journal* of November 15 attracted my attention. I am entirely in accord with your views as to the need of presenting to the public medical news accurately and ethically.

Coöperation by the medical profession with the lay press has ever been known for its glaring absence. Our own profession has been at fault in that it has not taken the initiative to see to it that the reporters are given intelligent, accurate and ethical data for publication. You suggest a Publicity Committee. If my memory serves me right, in March, 1932, the Executive Secretary of the Medical Information Bureau of the New York Academy of Medicine addressed the New England Medical Council on this very subject of medical publicity by organizations and individual physicians. From my personal investigation of this Bureau, I am of the opinion that it fills exactly the need to which you have referred in your editorial.

As Dr. Galdston, the Executive Secretary, states "the Bureau has constantly grown in influence. The leading newspapers of our community are calling on it for help, advice and information, and through it are tapping the best medical information there is

available in the community. Through the hundred consultants serving the Bureau the press of the city has found it possible to secure, on quick notice, judicious and dependable information on a variety of subjects that outreach common imagination."

I believe there is a crying need for such a bureau in the larger cities of New England, not organized on a State Medical Society basis necessarily, but so established to care for sections, or counties, or parts of counties in each state.

STANLEY B. WELD, M.D.
179 Allyn Street, Hartford, Conn.

BUILDING THE PANAMA RAILROAD

DIRECTIONS FOR HEALTH IN THE TROPICS IN 1850

Mr. Editor:

The following is from "The Panama Gateway" by Joseph Bucklin Bishop, Secretary of the Isthmian Canal Commission (New York, Charles Scribner's Sons, 1913). The quotation:

"Mr. Trautwine, writing on January 6, 1851, to the *American Railroad Journal*, said in a long and extremely interesting letter:

> 'At this time (May and June, 1850) no accommodation was procurable for ourselves and our workmen, except a small brig. Our laboring force was consequently very limited, and the rainy season having fully set in, converted the earth into a perfect swamp; and moreover prevented the burning of the dense forest which we were attempting to clear. The mosquitoes and sand flies were at the same time so numerous, that it was with difficulty we could induce the laborers to continue at their work—and that only by remaining with them, in person, and aiding them during the whole day. These discomforts, together with the stifling heat and myriads of insects in the cabin and hold of our small brig, prevented other sleep than that arising from exhaustion and frequently compelled us to pass whole nights on deck, in the rain, rather than encounter the annoyances below.'"

Bishop tells us that "There was no suspicion at that time that the mosquitoes were transmitting the fevers from one person to another, and were something worse than annoying pests. In his 'Private Notes' published some years ago, Mr. Trautwine made this interesting and curious entry:

> 'TROPICAL PRECAUTIONS
>
> A veil over the face is a partial protection from miasmatic vapors.
>
> *Dry* rooms are important. Sheet iron stoves. When camping out a large brushwood fire all night.
>
> Keep closed such doors and windows as open to winds blowing across marshes, very important; especially to the sick. But if they must be open have screens of gauze or *copper* wire, which is better than iron, if near salt water, as it does not rust.
>
> Mosquito nets are good, not only against insects but miasma. Bolting cloth is strongest and best.'"

Bishop says, "Because there was less fever among persons protected by veils and screens, it was a natural conclusion that those barriers were excluding the miasma itself rather than the transmitters of it."

It is interesting to note in Bishop's book the comments of Froude, the great English historian, who visited Panama in 1885 and 1886, that is, thirty-five years after Trautwine's directions.

> "In all the world there is not, perhaps, now concentrated in any single spot so much swindling and villainy, so much foul disease, such a hideous dung-heap of moral and physical abomination as in the scene of this far-famed undertaking of nineteenth-century engineering. The scene of operations is a damp, tropical jungle, intensely hot, swarming with mosquitoes, snakes, alligators, scorpions, and centipedes, the home, even as Nature made it, of yellow fever, typhus and dysentery and now made immeasurably more deadly by the multitudes of people who crowd thither."

Certainly Trautwine's observations and directions for life in the tropics, written so many years ago, are interesting reading at the present time.

Yours very truly,

WM. PEARCE COUES, M.D.
November 17, 1934,
12 Monmouth Court,
Brookline, Massachusetts.

The Massachusetts Medical Society

DR. GALLIE, SHATTUCK LECTURER FOR 1935

William E. Gallie, M.D., F.A.C.S., F.R.C.S. (Eng.), Professor of Surgery, University of Toronto Faculty of Medicine and Surgeon-in-Chief, Toronto General Hospital, has accepted the honor of the appointment to deliver the Shattuck Lecture for 1935.

SECOND ANNUAL POSTGRADUATE MEDICAL EXTENSION COURSE

The following sessions have been arranged by the Committee:

Barnstable

Sunday, December 2, at 4:00 P.M., at the Cape Cod Hospital, Hyannis. Subject: Cardiovascular Disease (Third Session). John I. B. Vail, M.D., Chairman.

Berkshire

Thursday, December 6, at 4:30 P.M., at the House of Mercy Hospital, Pittsfield. Subject: Cardiovascular Disease (First Session). Albert C. England, M.D., George S. Reynolds, M.D., Chairmen.

Bristol North (Attleboro Section)
Tuesday, December 4, at 4:00 P.M., at the Sturdy Memorial Hospital, Attleboro. Subject: Nutrition in Health and Disease (Second Session). William M. Stobbs, M.D., Chairman.

Bristol North (Taunton Section)
Wednesday, December 5, at 7:30 P.M., at the Morton Hospital, Taunton. Subject: Cardiovascular Disease (First Session). Arthur R. Crandell, M.D., Chairman.

Bristol South (Fall River Section)
Monday, December 3, at 4:00 P.M., at the Stevens Clinic of the Union Hospital, Prospect Street, Fall River. Subject: Endocrinology (Second Session). Eugene A. McCarthy, M.D., Sub-Chairman.

Essex North
Tuesday, December 4, at 4:00 P.M., at the Hotel Bartlett, 95 Main Street, Haverhill. Subject: Dermatology and Syphilis. Francis W. Anthony, M.D., Chairman.

Franklin
Wednesday, December 5, at 8:00 P.M., at the Franklin County Public Hospital, Greenfield. Subject: Obstetrics and Gynecology (First Session). Halbert G. Stetson, M.D., Chairman.

Hampden
Thursday, December 6, at 4:00 P.M., at the Academy of Medicine, Professional Building, 20 Maple Street, Springfield, and at 8:00 P.M., at the Holyoke City Hospital, Holyoke. Subject: Surgery (Third Session). George L. Schadt, M.D., Chairman.

Hampshire
Wednesday, December 5, at 4:15 P.M., in the Nurses' Home of the Cooley Dickinson Hospital, Northampton. Subject: Dermatology and Syphilis. Robert B. Brigham, M.D., Chairman.

Middlesex East
Wednesday, December 5, at 4:00 P.M., at the Melrose Hospital, Melrose. Subject: Surgery (Third Session). Joseph H. Fay, M.D., Chairman.

Middlesex South
Monday, December 3, at 4:30 P.M., at the Cambridge Hospital, Mt. Auburn Street, Cambridge. Subject: Cardiovascular Disease (First Session). Charles E. Mongan, M.D., Chairman.

Norfolk
Monday, December 3, at 4:00 P.M., at the Faulkner Hospital, Jamaica Plain. Subject: Surgery (Second Session). Hugo B. C. Riemer, M.D., Chairman.

Norfolk South
Monday, December 3, at 8:30 P.M., at the Quincy City Hospital, Quincy. Subject: Surgery (First Session). David L. Belding, M.D., Chairman.

Plymouth
Tuesday, December 4, at 4:00 P.M., at the Brockton Hospital, Brockton. Subject: Surgery (Second Session). Walter H. Pulsifer, M.D., Chairman.

Worcester
Wednesday, December 5, at 7:30 P.M., in the Auditorium of the Nurses' Home of the Memorial Hospital, Worcester. Subject: Endocrinology (First Session). Erwin C. Miller, M.D., Chairman.

Worcester North (Ayer Section)
Thursday, December 6, at 8:00 P.M., at the Ayer Community Memorial Hospital, Ayer. Subject: Industrial Medicine (Second Session). Frank S. Bukeley, M.D., Chairman.

Worcester North (Fitchburg Section)
Friday, December 7, at 4:30 P.M., at the Burbank Hospital, Fitchburg. Subject: Surgery (Third Session). Edward A. Adams, M.D., Chairman.

NOTICES

A PRIZE OF FIFTY DOLLARS FOR CASE REPORTS BY INTERNS IN MASSACHUSETTS HOSPITALS

The attention of interns in Massachusetts hospitals is called to the fact that a prize of $50.00 has been offered by the Massachusetts Medical Society for the best written and most comprehensive case report, which may be submitted by one of their number holding any of the rotating internships for the year 1934-1935 in any Massachusetts hospital which is approved for intern training by the American Medical Association.

This report is to be typewritten, and when completed is to be sealed, unsigned, in a plain envelope, which in turn is to be placed together with a separate slip bearing the name and address of the contestant in a larger envelope, and sent to

The Massachusetts Medical Society,
Committee on Medical Education
and Medical Diplomas,
8 Fenway,
Boston, Mass.

The contest this year closes May 1, 1935. Reports may be submitted at any time prior to that date.

REMOVALS

LOUIS FELDMAN, M.D., announces the removal of his office from 270 Commonwealth Avenue, Boston, to 636 Beacon Street, Boston.

EDWIN BLAKESLEE DUNPHY, M.D., announces the removal of his office to 101 Bay State Road, Boston.

CLINIC AT THE PETER BENT BRIGHAM HOSPITAL

At 3:30 P.M. on Thursday, December 6, in the Amphitheatre of the Peter Bent Brigham Hospital Dr. Henry A. Christian, Physician-in-Chief, Hersey Professor of the Theory and Practice of Physic in the Harvard Medical School, will give a medical clinic. To it are cordially invited practitioners and medical students. These clinics will be repeated on Thursdays until May.

On Saturdays in the wards of the Peter Bent Brigham Hospital, from 10 to 12, staff rounds will be conducted by Dr. Christian. These are open to all physicians.

A CLINIC AT THE CHILDREN'S HOSPITAL

A Clinic at which Orthopedic, Medical and Surgical Cases will be presented will be held on Monday, December 3, 1934, at 4:00 P.M. in the Amphitheatre of the Children's Hospital.

LAWRENCE CANCER CLINIC

To the Physicians of the North Half of Essex County:

The regular Lawrence Cancer Clinic, to be held at Lawrence General Hospital, 1 Garden Street, Lawrence, upon Tuesday, December 4, at 10:00 A.M., will be a Demonstration Clinic with Channing C. Simmons, M.D., of Boston, Associate in Surgery at Harvard University Medical School, acting Surgeon-in-Chief to Collis P. Huntington Memorial Hospital, and member of the Cancer Commission of Harvard University, Boston, present as consultant. You are invited to accompany any of your patients whom you desire shall have this service, or to send them with a note, and a report will be returned to you. This service is gratis. Your attendance at the Clinic is always welcome.

This Clinic is endorsed by the Committee on Postgraduate Instruction of the Massachusetts Medical Society.

Committee

ROY V. BAKETEL, M.D.,
CHAS. J. BURGESS, M.D.,
FRED'K D. MCALLISTER, M.D.,
JOHN J. MCARDLE, M.D.,
HARRY H. NEVERS, M.D.,
THOS. V. UNIAC, M.D.,
J. FORREST BURNHAM, M.D., *Chairman.*

REPORTS AND NOTICES OF MEETINGS

FAULKNER HOSPITAL CLINICAL MEETING

The regular monthly clinical meeting was held at the Faulkner Hospital on Thursday afternoon, November 1.

Instead of a report on cases which had come to autopsy, two cases were presented in which the diagnosis was confirmed by biopsy.

One was a case in which there had been joint pains and fever preceding admission to the hospital. On admission to the hospital a pronounced eosinophilia developed in which the leukocyte count was around 20,000 and the eosinophiles around fifty per cent. The patient became more and more anemic and continued to go downhill in weight. Finally nodules appeared on the head which seemed to be attached to the periosteum. It was felt that probably there was some type of lymphoid malignancy with an eosinophilia which is sometimes present in Hodgkin's disease and neoplasms of this type. A biopsy was done and the nodule seemed typical of so-called rheumatic nodules. It was noted at the time of removal that the nodule was in the connective tissue covering the skull and had caused a definite erosion in the underlying bone, although not enough to show up by x-ray examination. No other pathology has been found and it is felt that we are probably dealing with a rheumatic fever infection in which a pronounced eosinophilia is the unusual feature. Since the biopsy the other nodules over the skull are gradually subsiding.

The other case was one in which the diagnosis of neoplasm in the epigastrium was obvious before exploration. The unusual feature was the fact that although the patient had lost forty pounds in weight and was markedly emaciated, there was practically no anemia as his color was good and the red count was 4,500,000. The case was presented to emphasize the importance of having a biopsy on the tumor because of the possibility that it might be a malignant growth of the round cell type which would be favorably influenced by x-ray therapy. Dr. Young called attention to the fact that mere exploration in these cases might be fatal, but even with this chance it was felt that in the long run it is less disturbing to these patients to have a biopsy done than it is to subject them to x-ray therapy if distinct benefit is not to be expected from this treatment. In this case the growth turned out to be a carcinoma and the patient recovered quickly and without discomfort from the exploration.

Following the presentation of these cases Dr. Robert C. Cochrane reported his experiences and the lessons learned from one hundred and thirty thyroidectomies which he has done in recent years at the Faulkner Hospital. In his group there were two toxic cases with a diffuse goiter in the second decade of life and one non-toxic case. It is rather unusual for a diffuse goiter with toxic symptoms to occur at this age. In the group there were two cases which had been operated on previously. He feels that a return of toxicity after an operation is an indication for a second operation although occasionally x-ray treatment is of benefit. He favors the removal of all adenomas simply enucleating them if there is no toxicity, but if there is prominence of the eyes he

removes some of the surrounding thyroid tissue. In the one case in which there was postoperative tetany, parathormone controlled the condition. In the cases with cardiac decompensation he found no benefit from digitalis, except in the cases with auricular fibrillation. In these cases it seemed to be of benefit and following operation in cases with auricular fibrillation he expects the auricular fibrillation to cease. In all of his toxic cases, whether the goiter was diffuse or nodular, he gives Lugol's solution before operation and has not seen any unfavorable results in the cases with nodular goiters. Up to the present time the value of thyroidectomy in cardiac decompensation and angina has not been definitely established in his mind. He feels, however, that it is more easy to control the myxedema in a case in which the myxedema has been produced artificially than in a true myxedema. He was complimentary to the nursing staff of the hospital by commenting upon the excellent nursing care which the patients of this type receive in this hospital.

THE FRANKLIN DISTRICT MEDICAL SOCIETY

The November meeting of the Franklin District Medical Society held November 13 at the Weldon Hotel, Greenfield, was well attended and enthusiastic.

It was voted that a Cancer Clinic be reëstablished in Franklin County and Drs. Pelletier, Hayes, Ellis and Marble were made a committee to arrange details.

Dr. Roderick Heffron of the State Department of Health Staff was introduced as guest speaker and chose for his topic "Lobar Pneumonia and Its Serum Treatment." He showed the incidence of pneumonia, its various types, its mortality with and without serum treatment. He told when, and when not, to use serum and what may be expected from its use. He also announced that typing can be done in five minutes at the Franklin County Hospital and that serum can be obtained free for the treatment of proper cases. The drop in mortality with the use of serum is very marked, Dr. Heffron stated.

CHARLES MOLINE, M.D., *Secretary.*

MASSACHUSETTS PSYCHIATRIC SOCIETY

At the annual meeting of the Massachusetts Psychiatric Society, held November 1, the following officers were elected:

President: Dr. C. Macfie Campbell.
Vice-President: Dr. Charles E. Thompson.
Secretary-Treasurer: Dr. Oscar J. Raeder.
Councilors: Dr. Winfred Overholser, Dr. W. Franklin Wood.

THE ESSEX SOUTH DISTRICT MEDICAL SOCIETY

A meeting of the Essex South District Medical Society was held at the Beverly Hospital, November 14, 1934, presenting the following program:

CLINICAL MEETING

Dr. Odeneal, 5:20 (15 mins.): Ionization Treatments of Allergic Rhinitis.

Dr. Swan, 5:35 (15 mins.): Purpura Hemorrhagica Thrombopenic (Idiopathic).

Dr. Parkhurst and Dr. Branch, 5:50 (35 mins.): Agranulocytosis. Infectious Mononucleosis. Exhibit of X-Rays on Rickets and Lead Poisoning.

Dr. Johnson, 6:25 (35 mins.): Acute Appendicitis. Carcinoma of Stomach. Pancreatic Cyst. Mistakes in Diagnosis. Hyperthyroidism.

The dinner at seven was followed by an address by the guest of the evening, Dr. William P. Murphy of Boston, whose subject was "Various Types of Anemia." Dr. Murphy showed the Lederle film on the preparation and use of liver extract, which illustrates the advantages of this treatment as compared with the ingestion of liver substance in pernicious anemia. He spoke also of its use in hypochromic anemia in conjunction with adequate doses of iron, and emphasized its primacy in the treatment of agranulocytic anemia and other forms of leucopenia such as are encountered in some acute infections.

WM. T. HOPKINS, *Reporter.*

FAULKNER HOSPITAL CLINICAL MEETING

The next meeting will be held at the Faulkner Hospital on Thursday afternoon, December 6, at 5:00 P.M. In addition to the usual clinical pathological conference on the cases which have come to autopsy during the month Dr. John B. Hazard will give a short talk on "Haverhill Fever (Erythema Arthriticum Epidemicum)." All physicians are invited.

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Van Dyke Street entrance) Tuesday evening, December 11, at 8:15 P.M.

PROGRAM

Presentation of Cases.

The Development in the Treatment of Pulmonary Tuberculosis from 1696 to the Present Time. By Dr. Gerardo M. Balboni.

Demonstration: The Library May Afford a Certain Amount of Entertainment. By Dr. Reginald Fitz.

MARSHALL N. FULTON, M.D., *Secretary.*

GREATER BOSTON MEDICAL SOCIETY

The next meeting of the Greater Boston Medical Society will be held on Tuesday, December 4, at 8:15 P.M. in the Auditorium of the Beth Israel Hospital, Boston. Speaker: William Jason Mixter, M.D., Neuro-Surgeon to the Massachusetts General Hospital. Subject: "Common Medical Symptoms in Neurological Surgery." Discussion by Harry C. Solomon, M.D. and Julius Loman, M.D.

D. B. STEARNS, M.D., *Secretary.*

BOSTON SOCIETY OF ANESTHETISTS

Next meeting Tuesday, December 4, in the Hotel Kenmore:

6:30—Dinner (main dining room).

8:00—Business and scientific meeting. Dr. Stanley Nowak will speak on "The Carotid Sinus and Its Relation to Various Anesthetics." (Colonial Room.)

All interested physicians are invited to attend both the dinner and the scientific meeting.

PHILIP D. WOODBRIDGE, M.D., *President.*

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, DECEMBER 3, 1934

Monday, December 3—

†4 P.M. Clinic. Children's Hospital Amphitheatre.
8 P.M. Boston Surgical Society. Harvard Club.

Tuesday, December 4—

†2:30-4 P.M. Ward visit (Pediatrics). Massachusetts Eye and Ear Infirmary.
†4-5 P.M. Seminar (Pediatrics). Massachusetts General Hospital. Pediatric Laboratory.
*5 P.M. Dunham Lecture. Harvard Medical School. Amphitheatre—Building C. Professor Friedemann.
*6:30 P.M. Dinner. 8 P.M. Business and Scientific Meeting of the Boston Society of Anesthetists. Hotel Kenmore.
8:15 P.M. Greater Boston Medical Society. Auditorium, Beth Israel Hospital.

Thursday, December 6—

*12 N. Clinico-Pathological Conference. Massachusetts General Hospital. Pathological Building.
†12 N. Clinico-Pathological Conference. Children's Hospital Amphitheatre.
*3:30 P.M. Medical Clinic. Dr. Christian. Peter Bent Brigham Hospital Amphitheatre.
†4:30 P.M. Surgical Clinic. Children's Hospital Amphitheatre.
*5 P.M. Dunham Lecture. Harvard Medical School. Amphitheatre—Building C. Professor Friedemann.

Friday, December 7—

†12 N. Clinical meeting of Children's Medical Staff. Massachusetts General Hospital Ether Dome.

Saturday, December 8—

*10-12. Medical Staff rounds. Dr. Christian. Peter Bent Brigham Hospital.

*Open to the medical profession.
†Open to Fellows of the Massachusetts Medical Society.

December 3—Clinic at the Children's Hospital. See page 1036.

December 4—Greater Boston Medical Society. See page 1037.

December 4—Boston Society of Anesthetists. See notice above.

December 3-7—The Radiological Society of North America. See notice on page 562, issue of September 20.

December 4—Lawrence Cancer Clinic. See page 1036.

December 4, 6, 11—The Edward K. Dunham Lectures, "Problems Concerning the Pathogenesis of Infectious Diseases": Tuesday, December 4, "Distribution of dyes, drugs and toxins in the animal body." Thursday, December 6, "Distribution of dyes, drugs and toxins in the animal body" (continued). Tuesday, December 11, "The pathogenesis of diphtheria." At 5 o'clock at the Harvard Medical School, Amphitheatre, Building C, by Ulrich Friedemann, M.D., formerly Professor at the University of Berlin and Director of the Division of Infectious Diseases, Virchow Krankenhaus.

December 6—Clinic at the Peter Bent Brigham Hospital. See page 1036.

December 6—Faulkner Hospital Clinical Meeting. See page 1037.

December 6-8—Annual Conference of the National Society for the Prevention of Blindness. See page 736, issue of October 18.

December 7 and 8—Southeastern Branch of the American Urological Association will meet at the Biltmore Hotel, Atlanta, Georgia. For information address Dr. Earl Floyd, Secretary, Atlanta Biltmore Hotel, Atlanta, Georgia.

December 11—Harvard Medical Society. See page 1037.

MASSACHUSETTS DIETETIC ASSOCIATION

December 11—Tuesday, 8 P.M. "Food Allergy," Dr. Frank N. Allan, Department of Medicine, Lahey Clinic.

January 8—Tuesday, 8 P.M. "Careers and Natural Abilities," Professor Johnson O'Connor, Human Engineering Laboratory, Stevens Institute of Technology, Hoboken, N. J.

February 12—Tuesday, 8 P.M. "Diabetic Children," Dr. Priscilla White, Joslin Diabetic Unit.

March 12—Tuesday, 8 P.M. "The Effect of Diet on Anemia," Dr. Lewis Diamond, Instructor in Medicine, Harvard University Medical School, Associate Physician, Children's Hospital.

March 19—Tuesday, 2 P.M. Field Trip: Visit Storehouse, First National Stores.

April 9—Tuesday, 8 P.M. "Small Hospital Problems," Miss Margaret Copeland, Superintendent, Free Hospital for Women.

December 12—New England Dermatological Society will meet at the Boston City Hospital at 3 P.M.

December 12—New England Obstetrical and Gynecological Society will meet at the University Club, Boston.

December 14—William Harvey Society. Dr. Fuller Albright of the Massachusetts General Hospital will speak on "Parathyroid Disease."

April 29 - May 3, 1935—The American College of Physicians will meet at Philadelphia. For information address Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

June, 1935—Medical Library Association will meet in Rochester, N. Y. For details address the Secretary: Miss Frances N. A. Whitman, Librarian, Harvard University Schools of Medicine and Public Health, Boston, Mass.

DISTRICT MEDICAL SOCIETIES

ESSEX NORTH DISTRICT MEDICAL SOCIETY

The Semi-Annual Meeting will be held in January and the Annual Meeting in May, time, place and subject to be announced.

E. S. BAGNALL, M.D., Secretary.

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held on the second Tuesday of January, March, and May at the Weldon Hotel, Greenfield, Mass.

CHARLES MOLINE, M.D., Secretary.
Sunderland.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

January 9, 1935—Melrose.
March 13, 1935—Wakefield.
May 8, 1935—Winchester.

K. L. MACLACHLAN, M.D., Secretary.
1 Bellevue Street, Melrose.

PLYMOUTH DISTRICT MEDICAL SOCIETY

January—Goddard Hospital.
March—Plymouth County Hospital.
April—Lakeville Sanatorium.

SUFFOLK DISTRICT MEDICAL SOCIETY

January 23, 1935—General Meeting in association with the Boston Medical Library. Speaker and subject to be announced later.

March 27, 1935—Clinical Meeting at the Boston Lying-in Hospital.

April 24, 1935—Clinical Meeting at the Children's Hospital.

The medical profession is cordially invited to attend all of these meetings.

ROBERT L. DeNORMANDIE, M.D., President.
GEORGE P. REYNOLDS, M.D., Secretary.
HENRY T. HUTCHINS, M.D., Boston Medical Library.

WORCESTER DISTRICT MEDICAL SOCIETY

December 12—Wednesday evening. St. Vincent Hospital, Worcester, Mass. 6:30 P.M.: Dinner. 7:30 P.M.: Scientific program and business session. Announcement of subjects and speakers to be presented at a later date. Dinner complimentary by the Hospital.

January 9, 1935—Wednesday evening. Worcester City Hospital, Worcester, Mass. 6:30 P.M.: Buffet supper. 7:30 P.M.: Scientific program and business session. Announcement of subjects and speakers to be presented at a later date. Buffet supper complimentary by the Hospital.

February 13, 1935—Wednesday evening. Worcester State Hospital, Worcester, Mass. 6:30 P.M.: Dinner. 7:30 P.M.: Scientific program and business session. Announcement of subjects and speakers to be presented at a later date. Dinner complimentary by the Hospital.

March 13, 1935—Wednesday evening. The Memorial Hospital, Worcester, Mass. 6:30 P.M.: Buffet supper. 7:30 P.M.: Scientific program and business session. Announcement of subjects and speakers to be presented at a later date. Buffet supper complimentary by the Hospital.

April 10, 1935—Wednesday evening. Worcester Hahnemann Hospital, Worcester, Mass. 6:30 P.M.: Dinner. 7:30 P.M.: Scientific program and business session. Announcement of subjects and speakers to be presented at a later date. Dinner complimentary by the Hospital.

May 8, 1935—Wednesday afternoon and evening. Annual Meeting of the Worcester District Medical Society. The time and place of this meeting will be announced later.

ERWIN C. MILLER, M.D., Secretary.
27 Elm Street, Worcester.